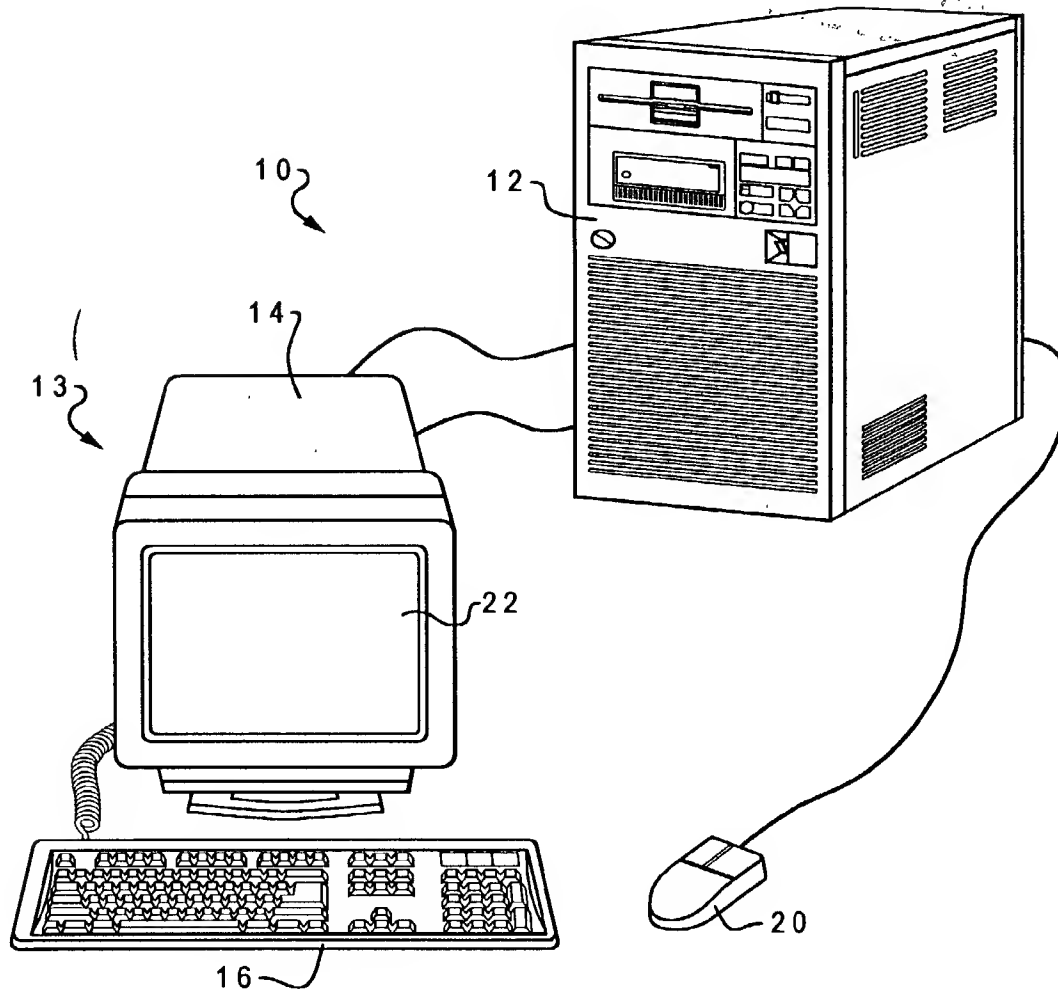


AUS920010962US1  
Gabele, et al.  
Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

1/62



*Fig. 1*  
*Prior Art*

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 Gabele, et al.  
 Centralized Disabling Of Instrumentation Events  
 Within A Batch Simulation Farm Network

2/62

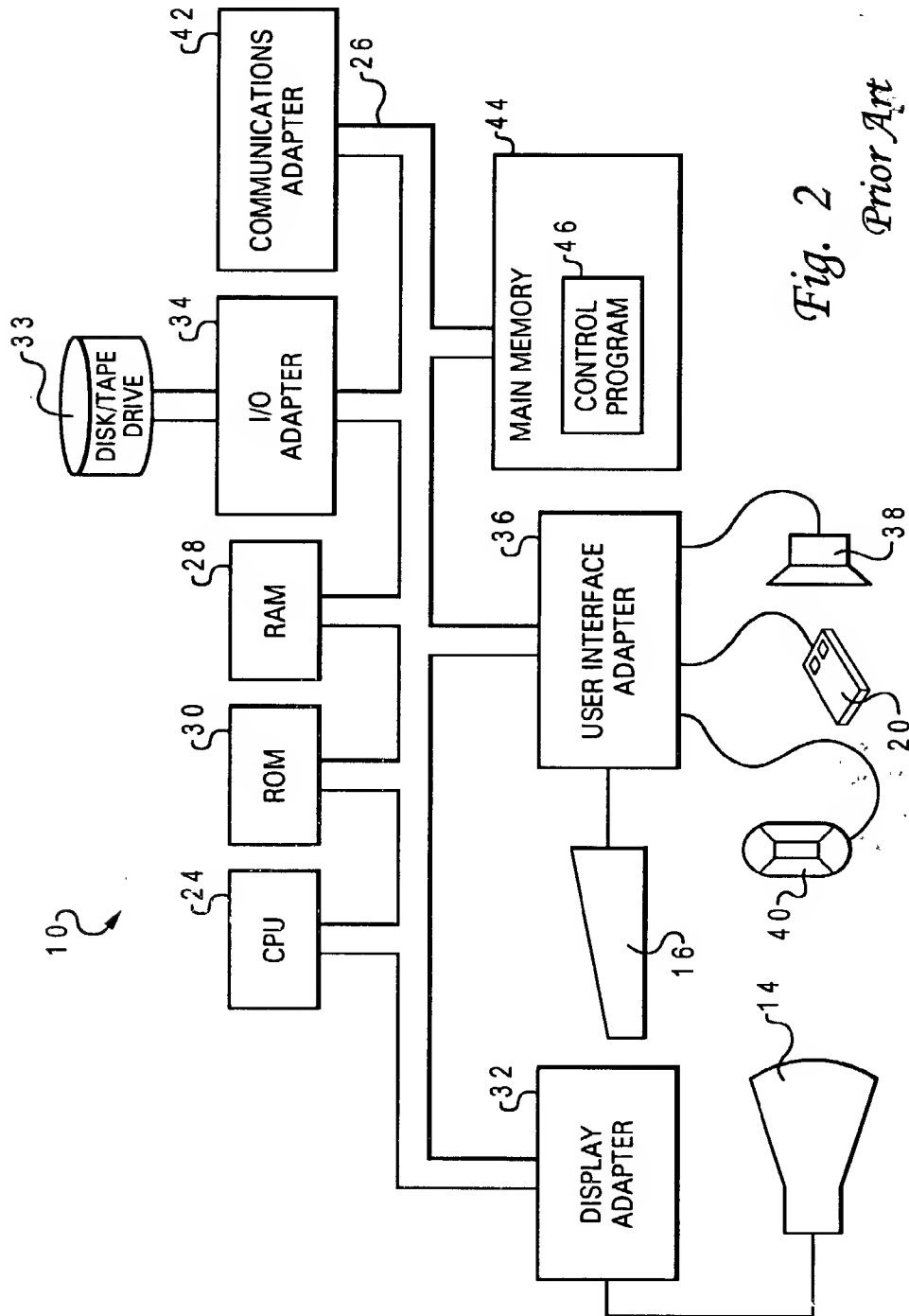


Fig. 2  
 Prior Art

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 Gabele, et al.  
 Centralized Disabling Of Instrumentation Events  
 Within A Batch Simulation Farm Network

3/62

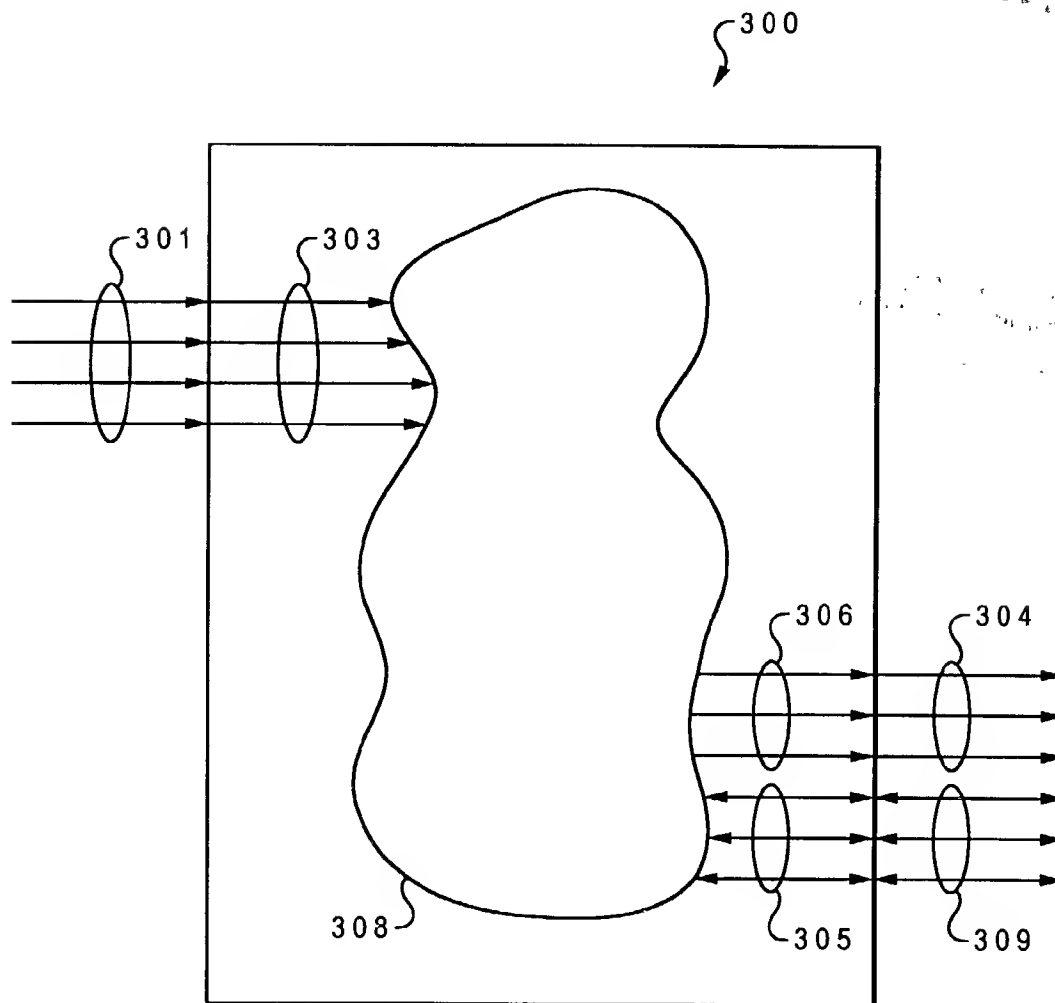


Fig. 3A

329



AUS920010962US1  
 Gabele, et al.  
 Centralized Disabling Of Instrumentation Events  
 Within A Batch Simulation Farm Network

6/62

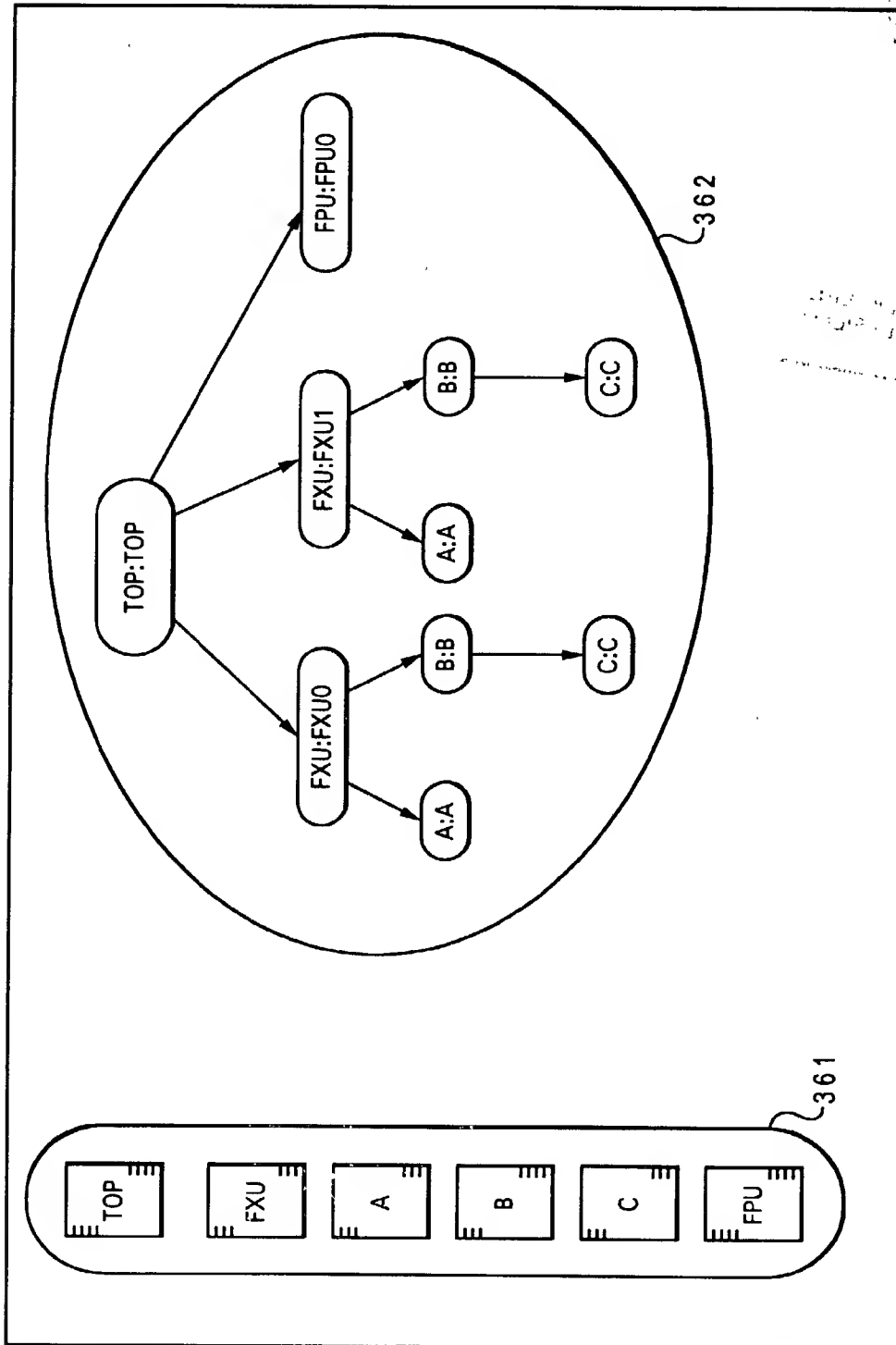
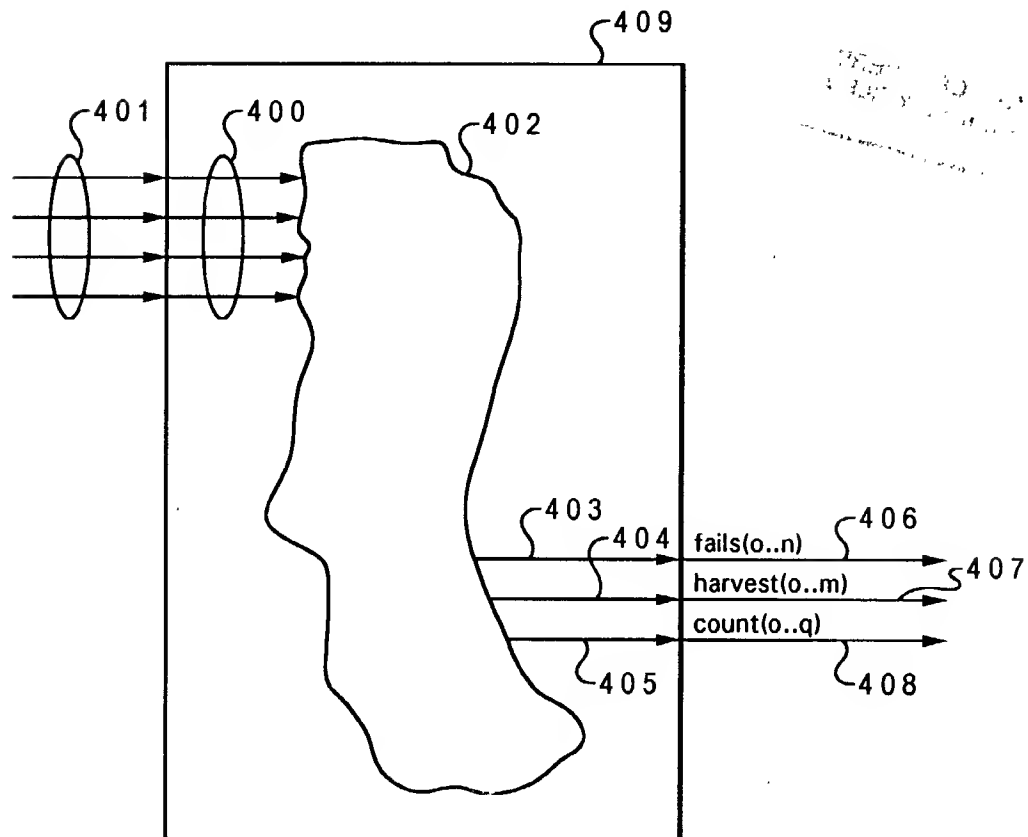
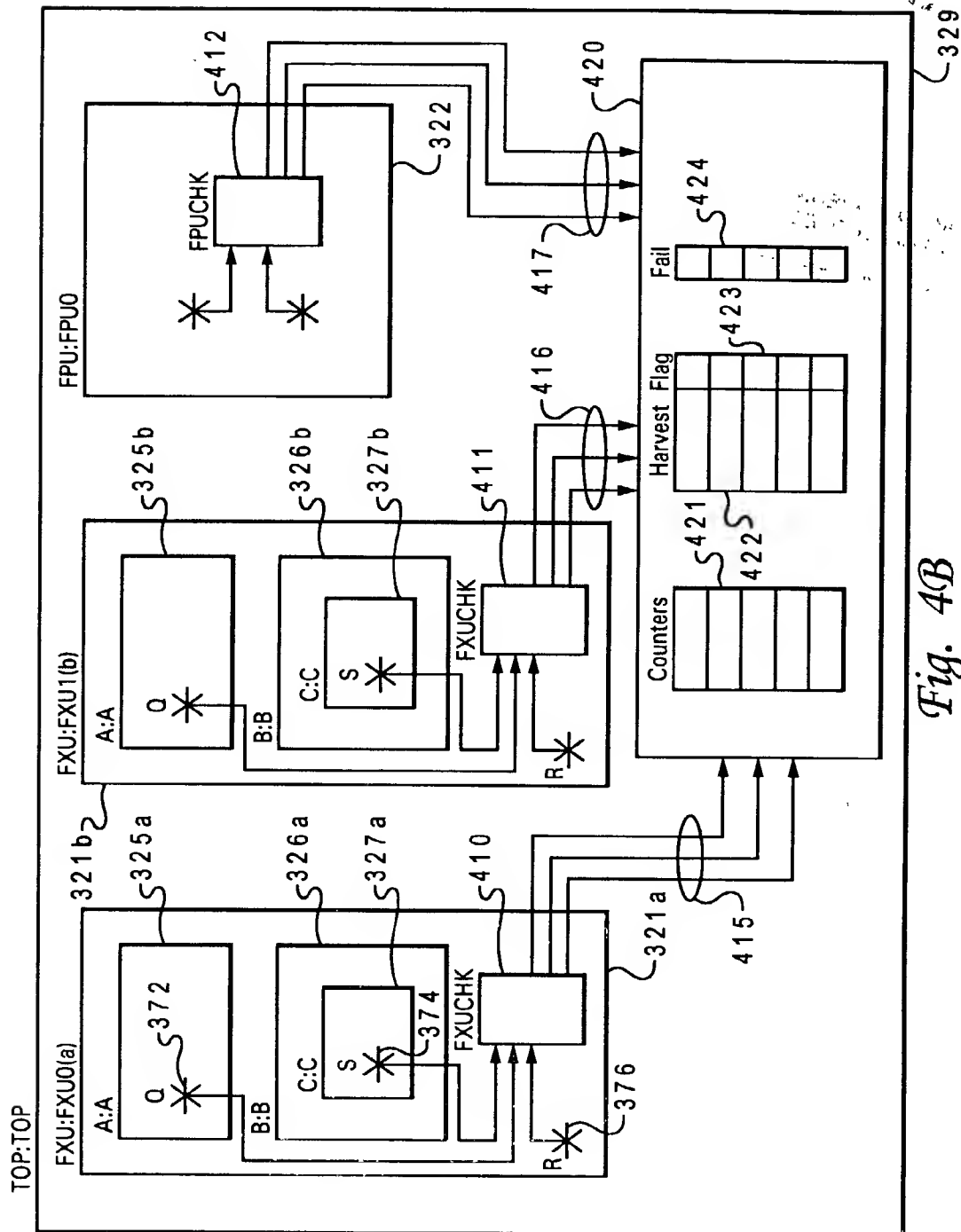


Fig. 3D



*Fig. 4A*



**Fig. 4B**



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Gabele, et al.  
Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

9/62

ENTITY FXUCHK IS

```

PORT(  S_IN      :    IN std_ulogic;
        Q_IN      :    IN std_ulogic;
        R_IN      :    IN std_ulogic;
        clock      :    IN std_ulogic;
        fails      :    OUT std_ulogic_vector(0 to 1);
        counts     :    OUT std_ulogic_vector(0 to 2);
        harvests   :    OUT std_ulogic_vector(0 to 1);
);

```

4 5 0

4 5 2 { --!! BEGIN  
--!! Design Entity: FXU;

4 5 3 { --!! Inputs  
--!! S\_IN => B.C.S;  
--!! Q\_IN => A.Q;  
--!! R\_IN => R;  
--!! CLOCK => clock;  
--!! End Inputs

4 5 4 { --!! Fail Outputs;  
--!! 0 : "Fail message for failure event 0";  
--!! 1 : "Fail message for failure event 1";  
--!! End Fail Outputs;

4 5 1

4 5 5 { --!! Count Outputs;  
--!! 0 : <event0> clock;  
--!! 1 : <event1> clock;  
--!! 2 : <event2> clock;  
--!! End Count Outputs;

4 5 6 { --!! Harvest Outputs;  
--!! 0 : "Message for harvest event 0";  
--!! 1 : "Message for harvest event 1";  
--!! End Harvest Outputs;

4 5 7 { --!! End;

4 4 0

ARCHITECTURE example of FXUCHK IS

BEGIN

... HDL code for entity body section ...

END;

4 5 8

*Fig. 4C*

10/62

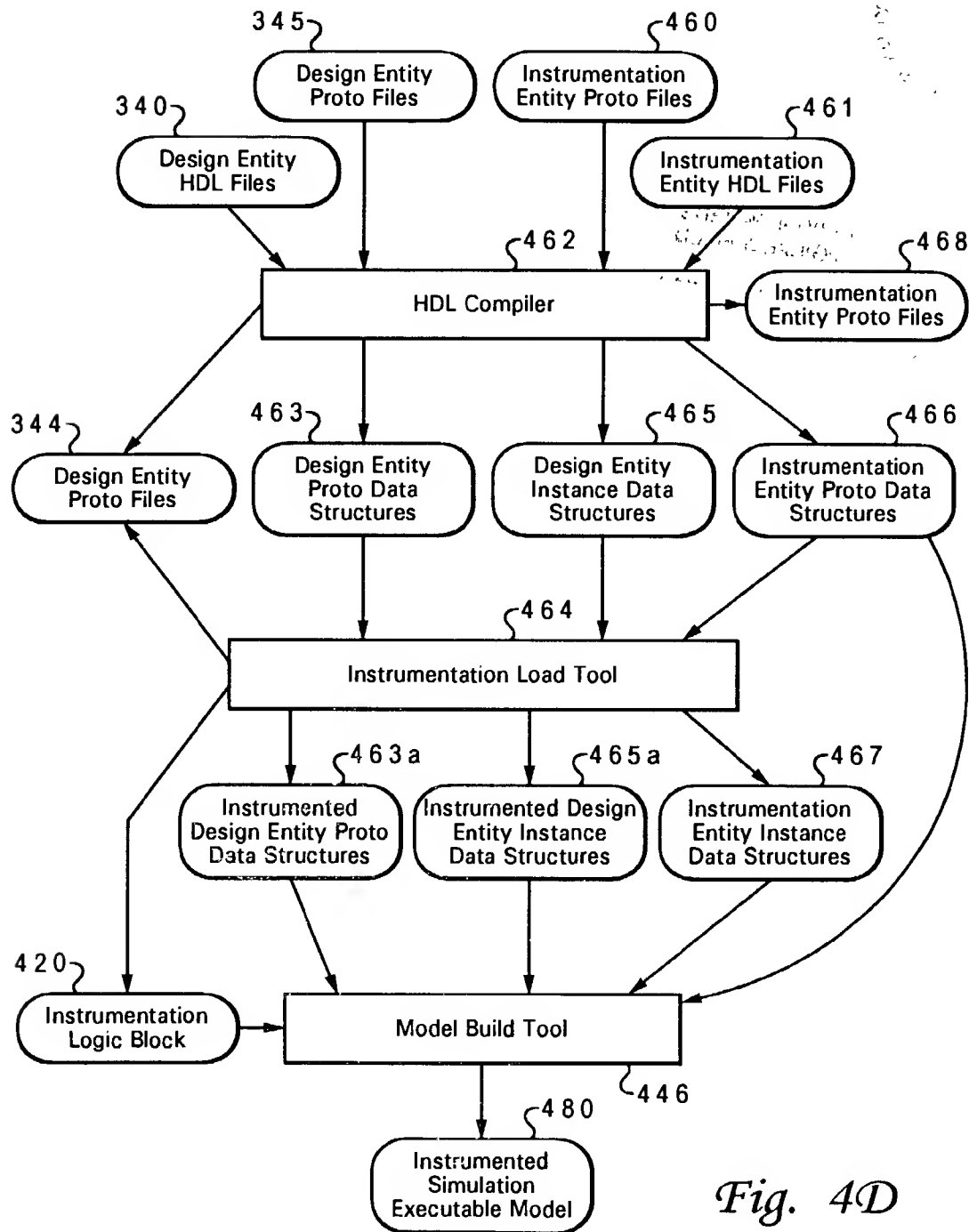
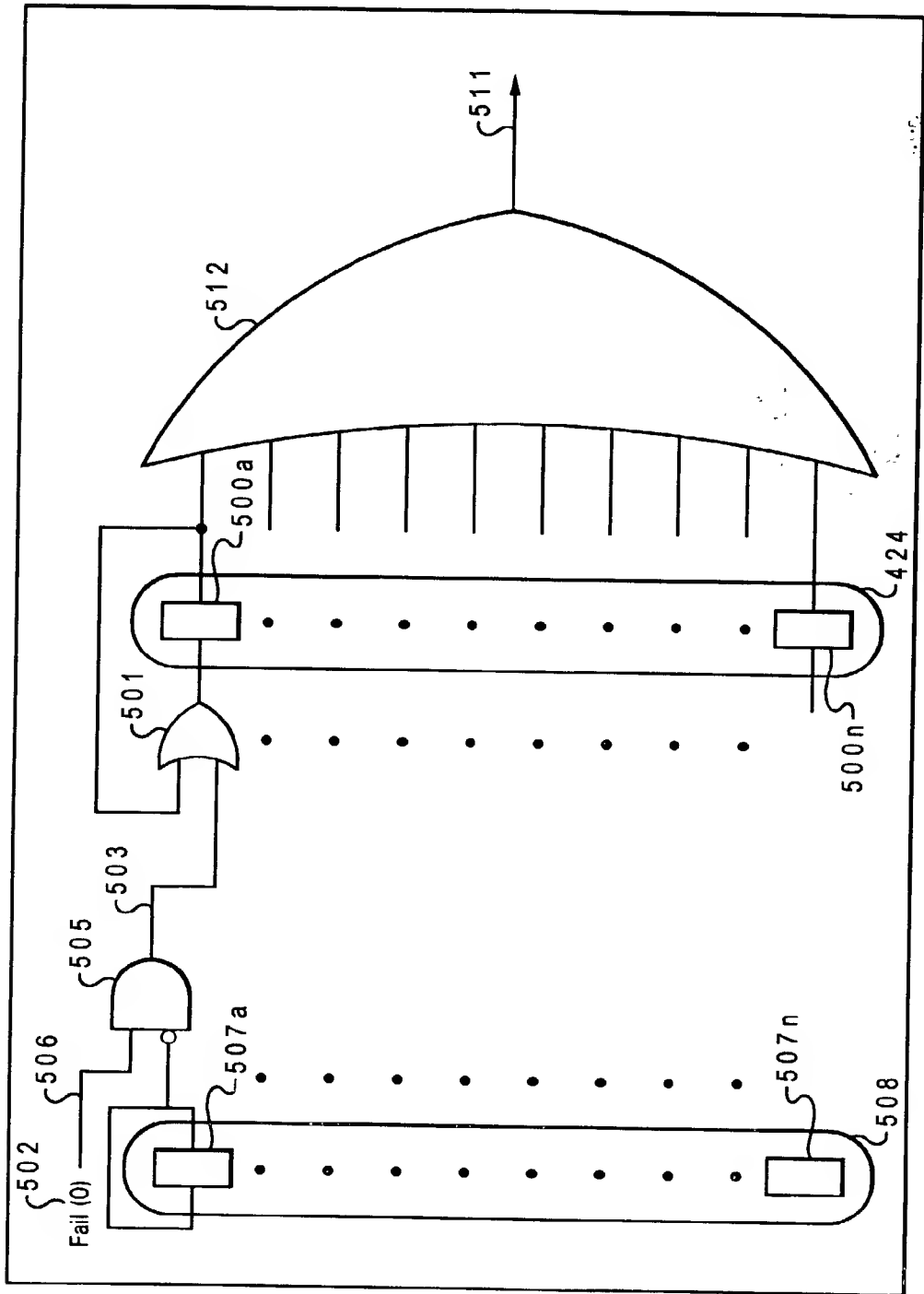


Fig. 4D

Fig. 4E

12/62



420

Fig. 5A





AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

15/62

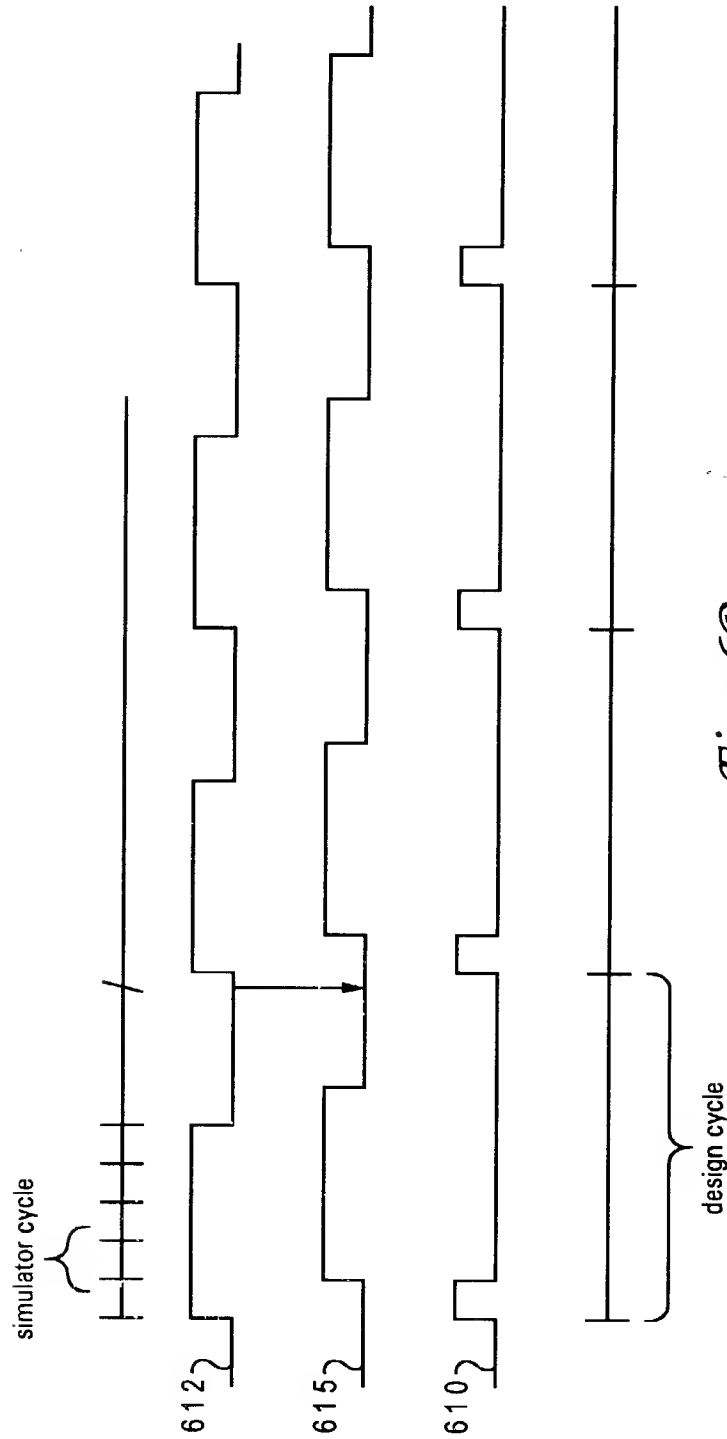


Fig. 6B

16/62

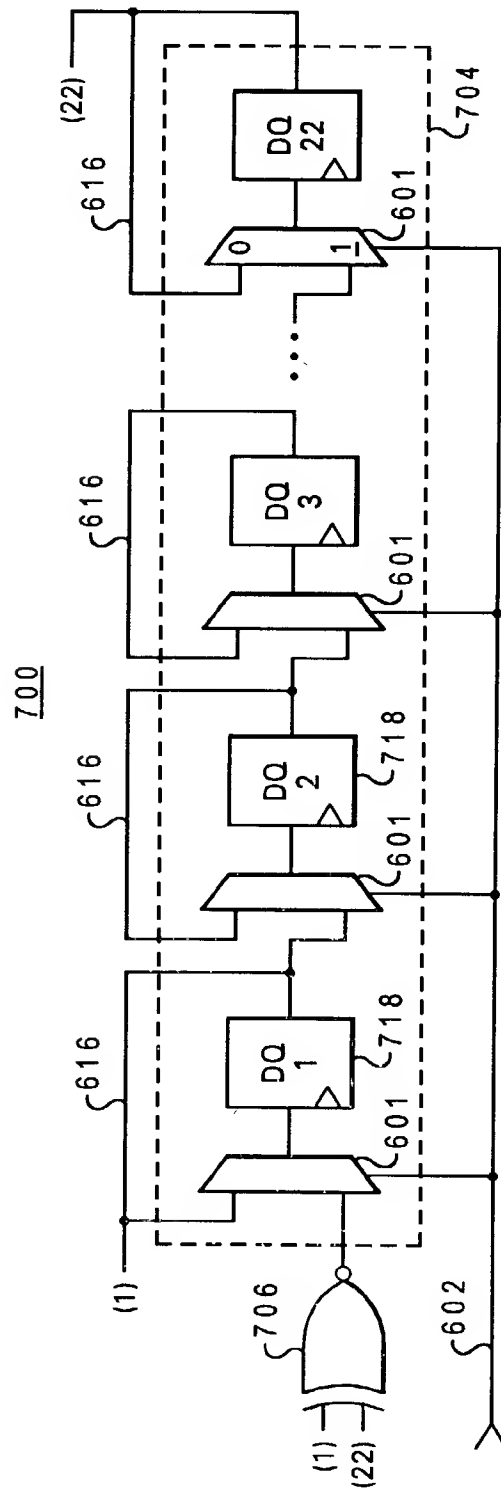
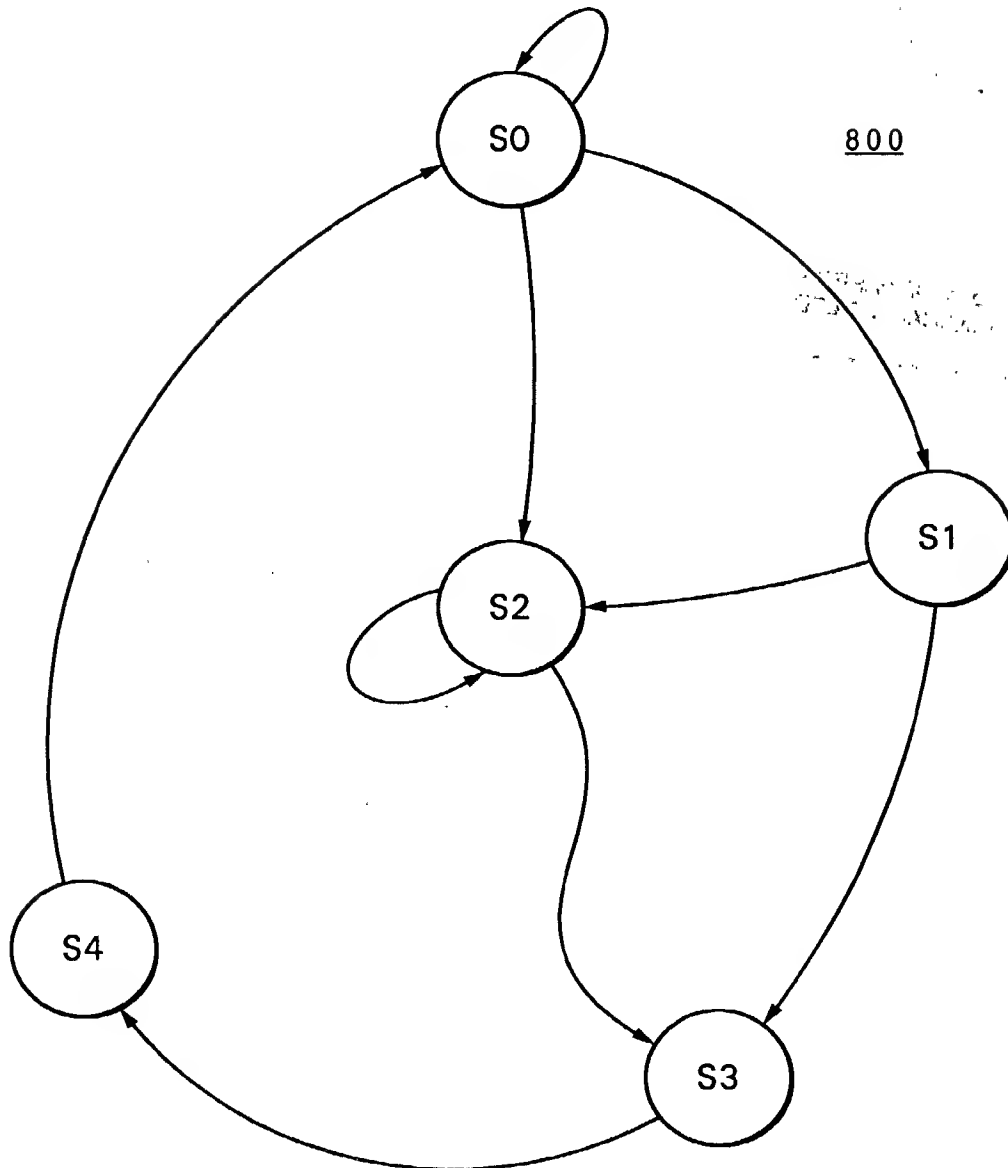


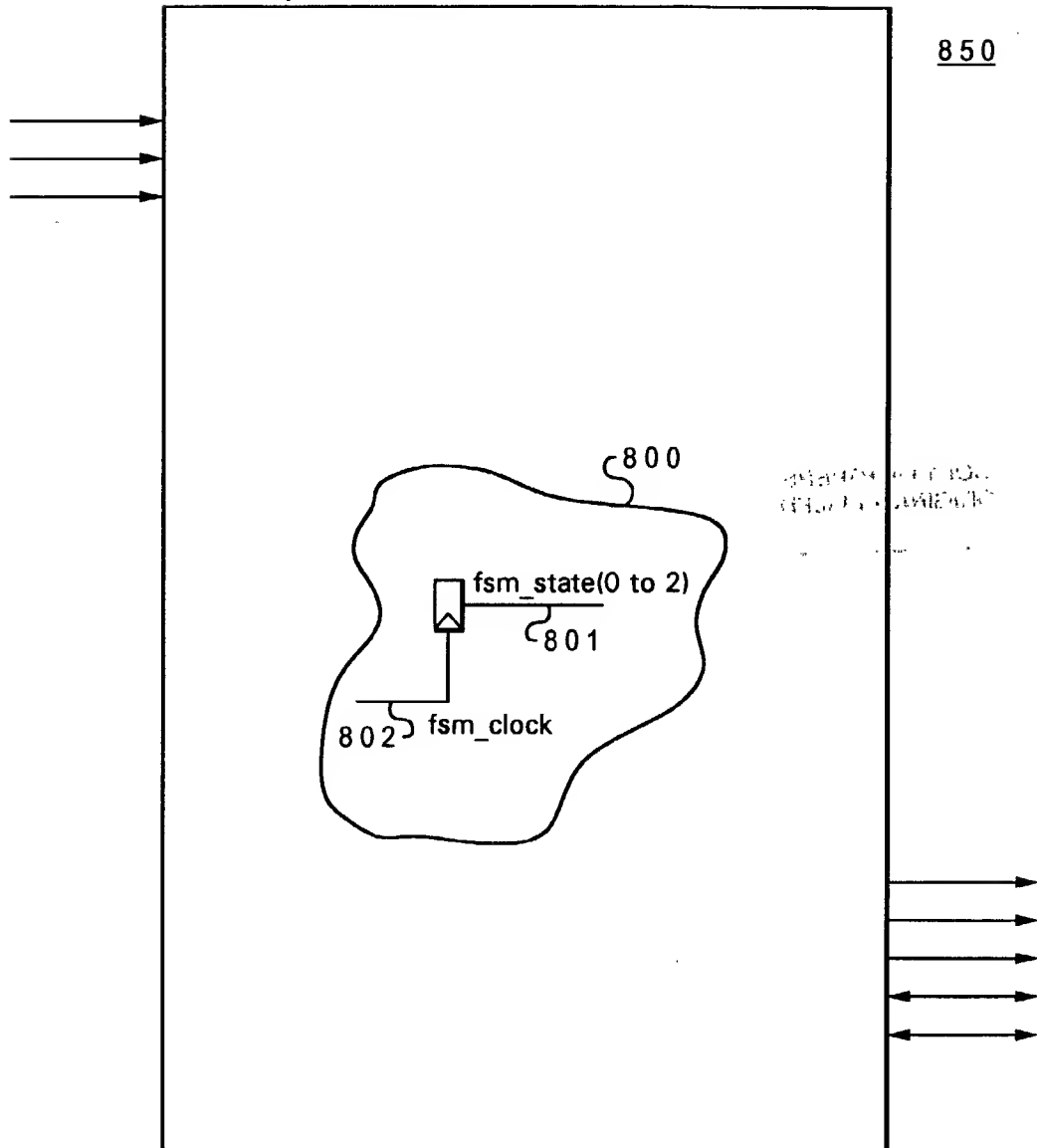
Fig. 7





*Fig. 8A*  
*Prior Art*

850



*Fig. 8B*  
*Prior Art*

AUS920010962US1  
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Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

19/62

ENTITY FSM IS

```
PORT(
    ....ports for entity fsm....
);
```

ARCHITECTURE FSM OF FSM IS

BEGIN

... HDL code for FSM and rest of the entity ...

fsm\_state(0 to 2) <= ... Signal 801 ...

8 5 3 {	--!! Embedded FSM : examplefsm;	}	8 5 2 {	8 6 0 {
8 5 9 {	--!! clock	: (fsm_clock);	}	}
8 5 4 {	--!! state_vector	: (fsm_state(0 to 2));	}	}
8 5 5 {	--!! states	: (S0, S1, S2, S3, S4);	}	}
8 5 6 {	--!! state_encoding	: ('000', '001', '010', '011', '100');	}	}
8 5 7 {	--!! arcs	: (S0 => S0, S0 => S1, S0 => S2,	}	}
	--!!	(S1 => S2, S1 => S3, S2 => S2,	}	}
	--!!	(S2 => S3, S3 => S4, S4 => S0);	}	}
8 5 8 {	--!! End FSM;	}		

END;

*Fig. 8C*

AUS920010962US1  
Gabele, et al.  
Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

20/62

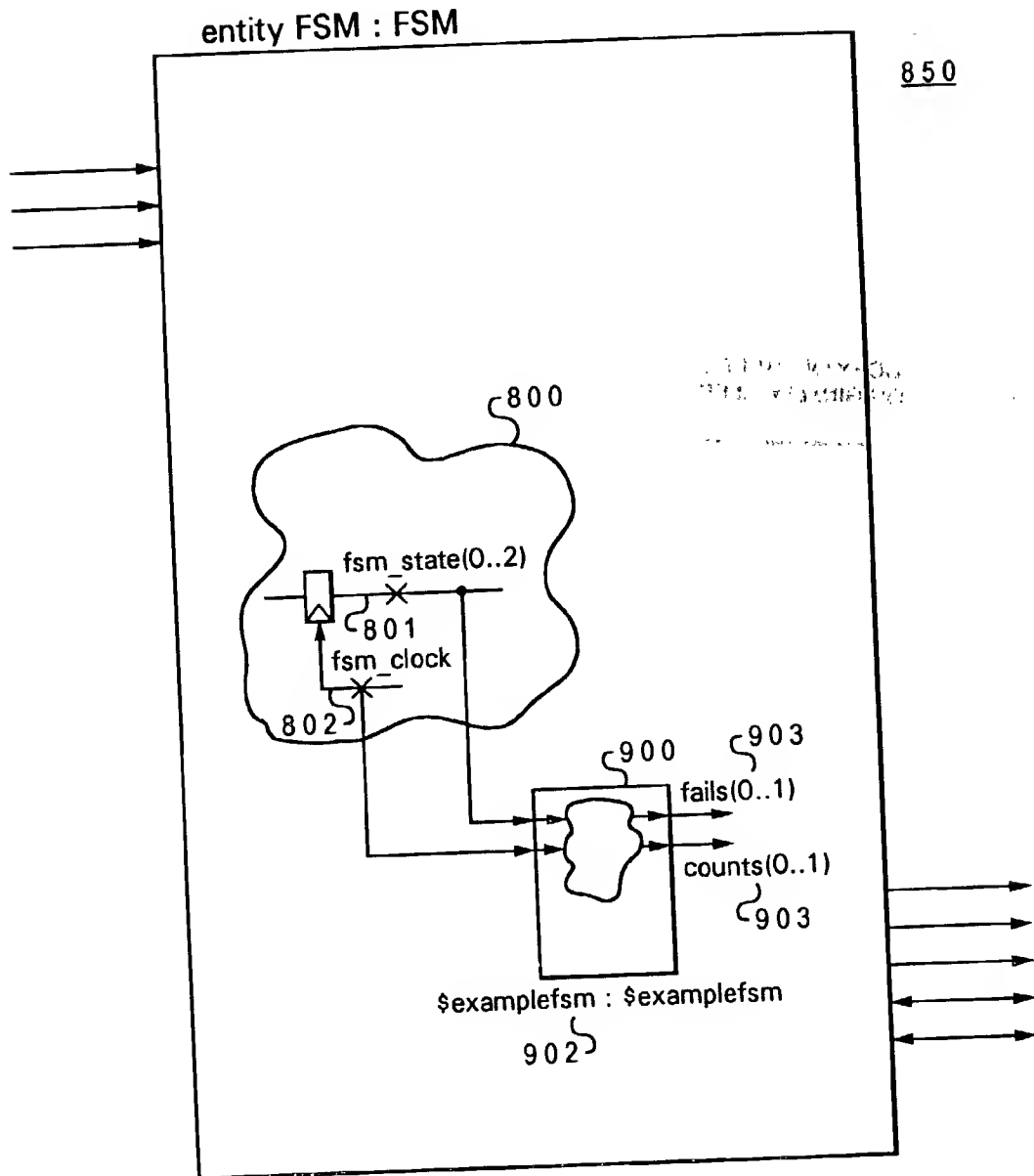


Fig. 9



22/62

1030 → <instantiation identifier> . <instrumentation entity name> . <design entity name> . <eventname>  
1032 →  
1034 →  
1036 →

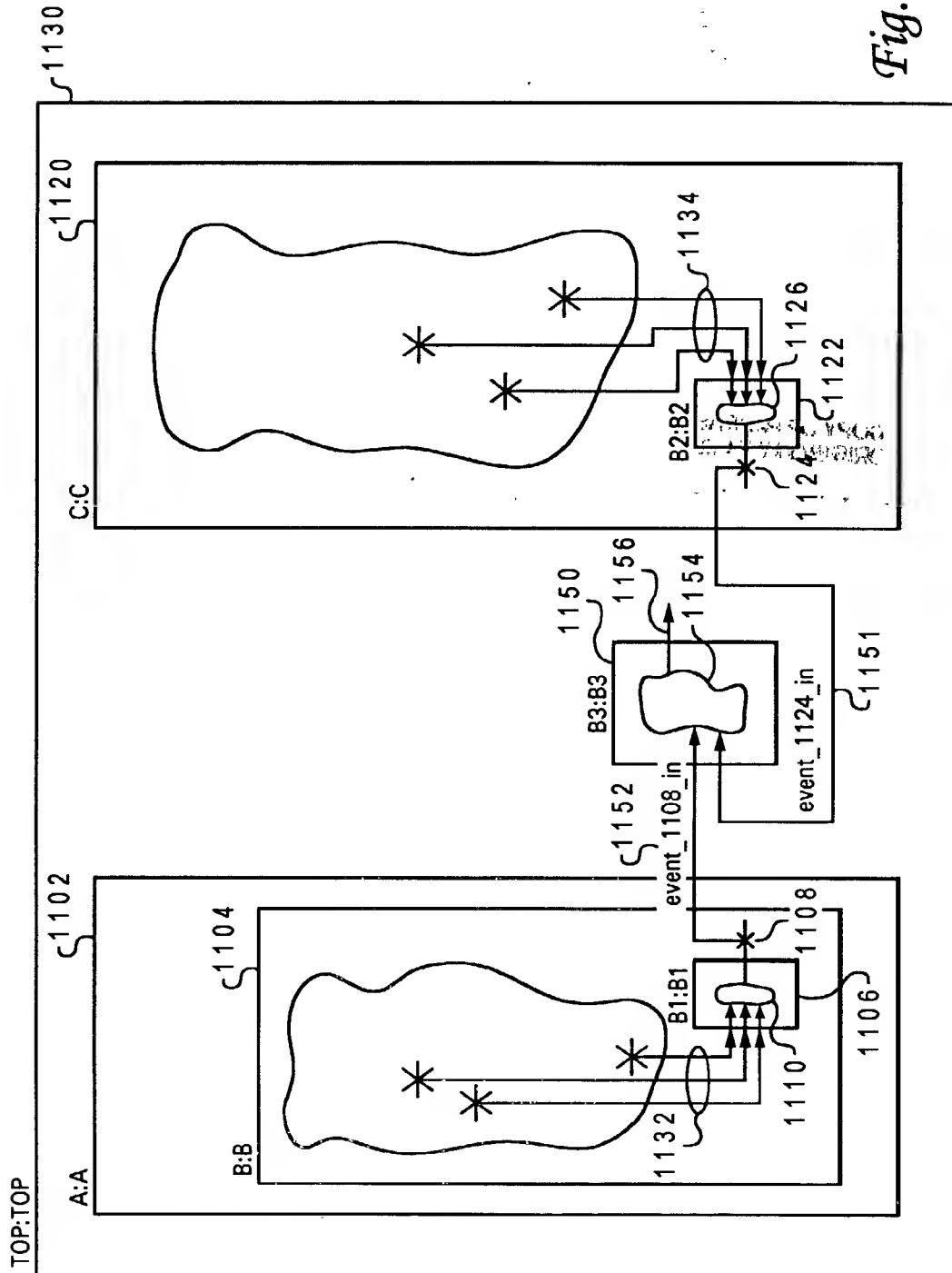
Fig. 10B

1030	1032	1034	1036
X1	B3	X	COUNT1
X1.Z	B1	Z	COUNT1
X1.Z	B2	Z	COUNT1
X2	B3	X	COUNT1
X2.Z	B1	Z	COUNT1
X2.Z	B2	Z	COUNT1
Y	B4	Y	COUNT1
Y.Z	B1	Z	COUNT1
Y.Z	B2	Z	COUNT1

Fig. 10C

1030 → <instantiation identifier> . <design entity name> . <eventname>  
1034 →  
1036 →

Fig. 10D



AUS920010962US1  
 Gabele, et al.  
 Centralized Disabling Of Instrumentation Events  
 Within A Batch Simulation Farm Network

24/62

```

--!! Inputs
--!! event_1108_in <= C.[B2.count.event_1108];
--!! event_1124_in <= A.B.[B1.count.event_1124];
--!! End Inputs
  
```

1163                      1165  
 {-----} {-----}  
 1164                      1166  
 {-----} {-----}

1161  
 1162

*Fig. 11B*

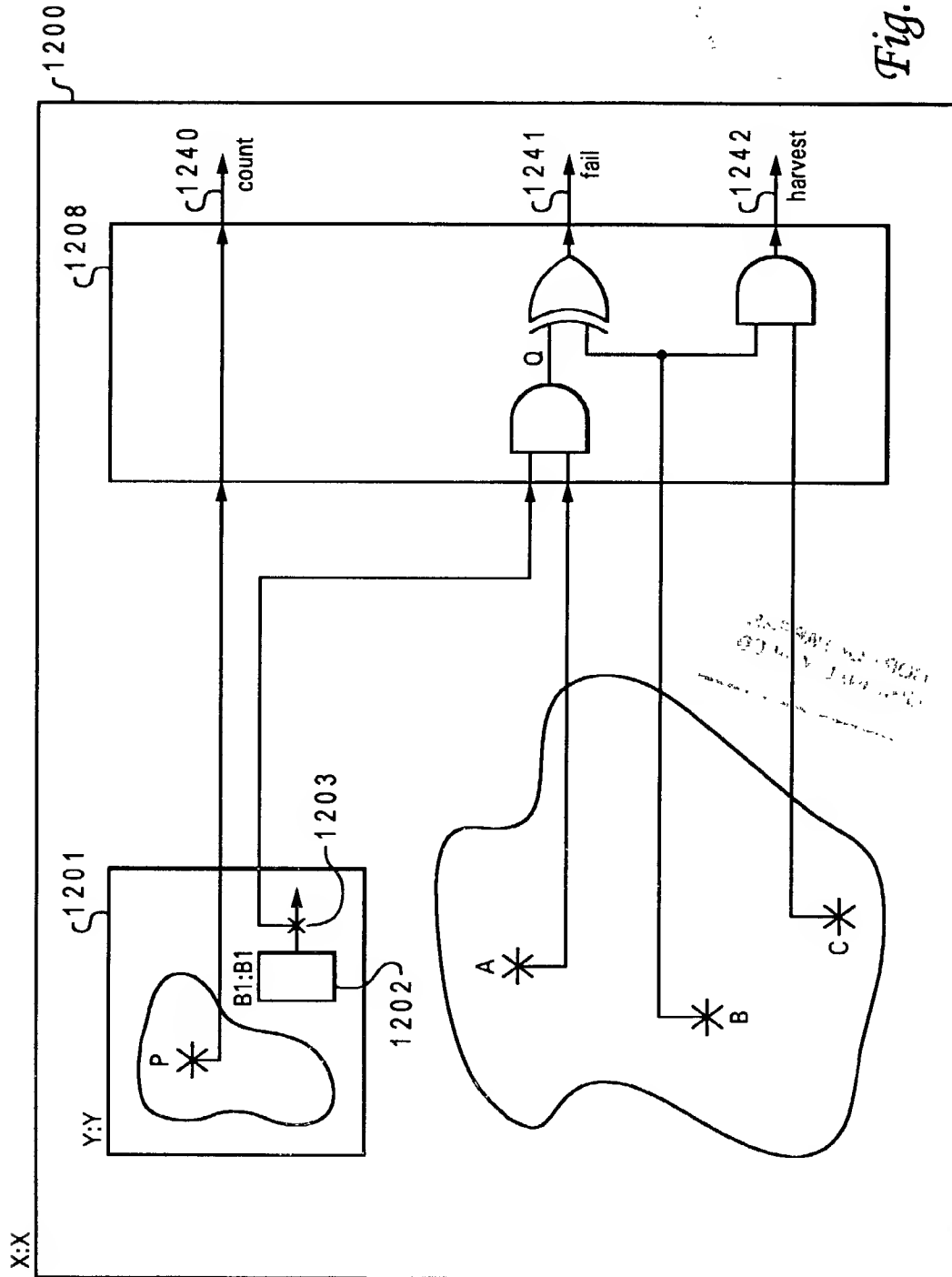
```

--!! Inputs
--!! event_1108_in <= C.[count.event_1108];
--!! event_1124_in <= B.[count.event_1124];
--!! End Inputs
  
```

1171  
 1172

*Fig. 11C*

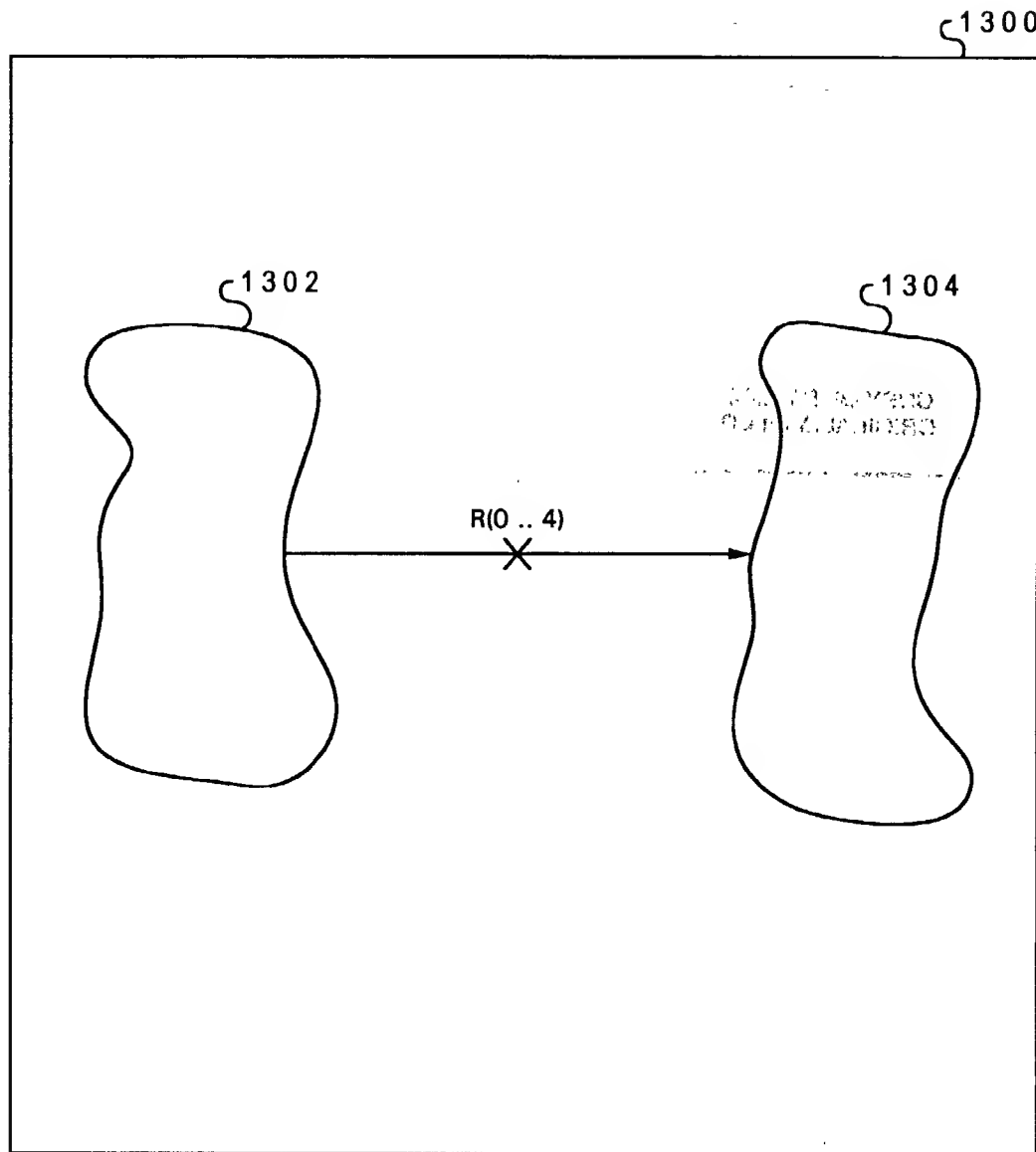




*Fig. 12B*

AUS920010962US1  
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 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

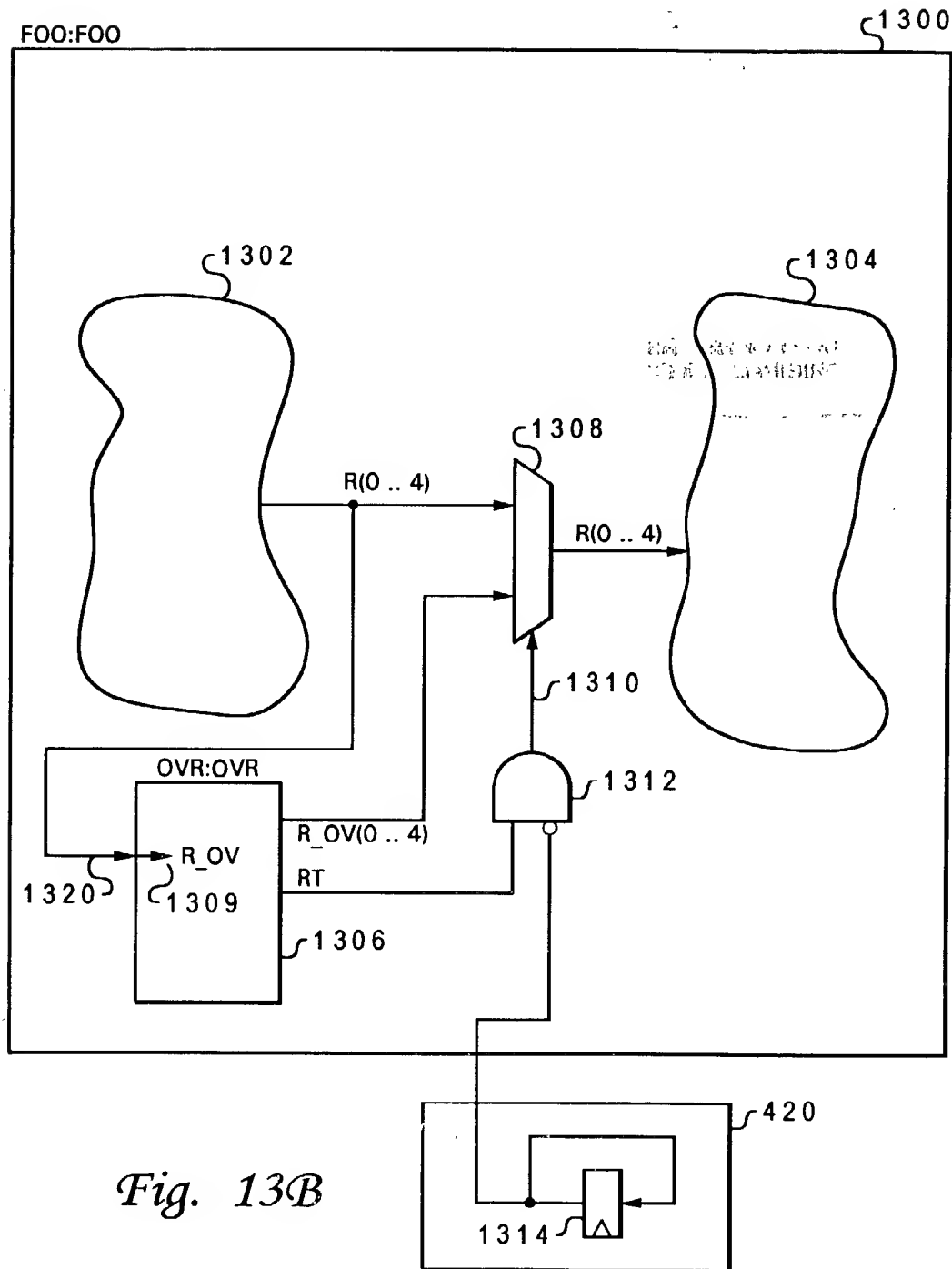
27/62



*Fig. 13A*

AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

28/62



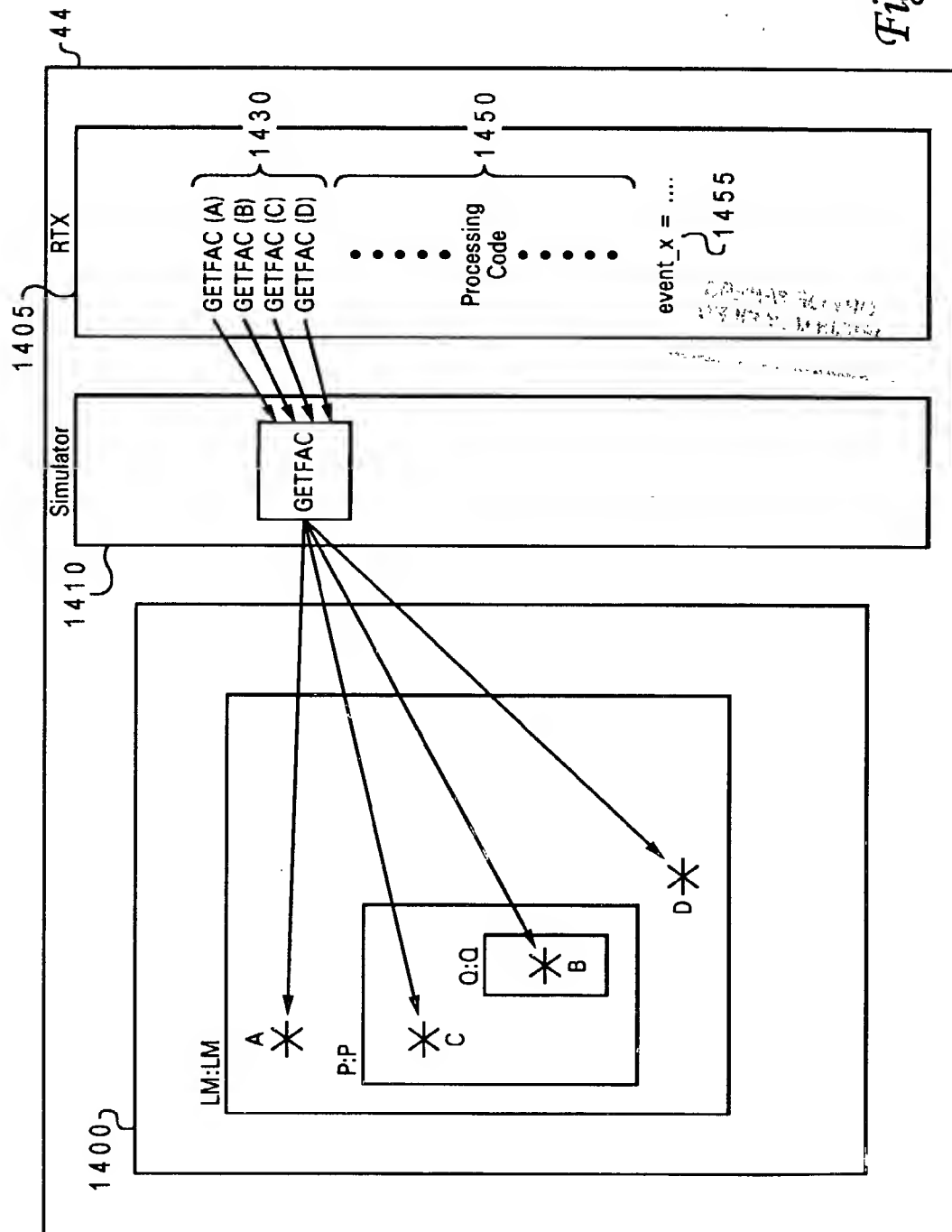
*Fig. 13C*



AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

31/62

Fig. 14A







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 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

33/62

```

ENTITY DET IS
    PORT(  A      : IN std_ulogic;
           B      : IN std_ulogic_vector(0 to 5);
           C      : IN std_ulogic;
           D      : IN std_ulogic;
           event_x : OUT std_ulogic_vector(0-to 2);
           x_here  : OUT std_ulogic;
    );

    --!! BEGIN
    --!! Design Entity: LM;

    --!! Inputs
    --!! A  => A;
    --!! B  => P.Q.B;
    --!! C  => P.C;
    --!! D  => D;
    --!! End Inputs

    --!! Detections
    --!! <event_x>:event_x(0 to 2) [x_here];
    --!! End Detections

    --!! End;

    ARCHITECTURE example of DET IS
    BEGIN
        ... HDL code ...

    END;
  
```

1491 {

1493 {

1495 {

1494 {

1480 }

*Fig. 14C*

AUS920010962US1  
Gabele, et al.  
Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

34/62

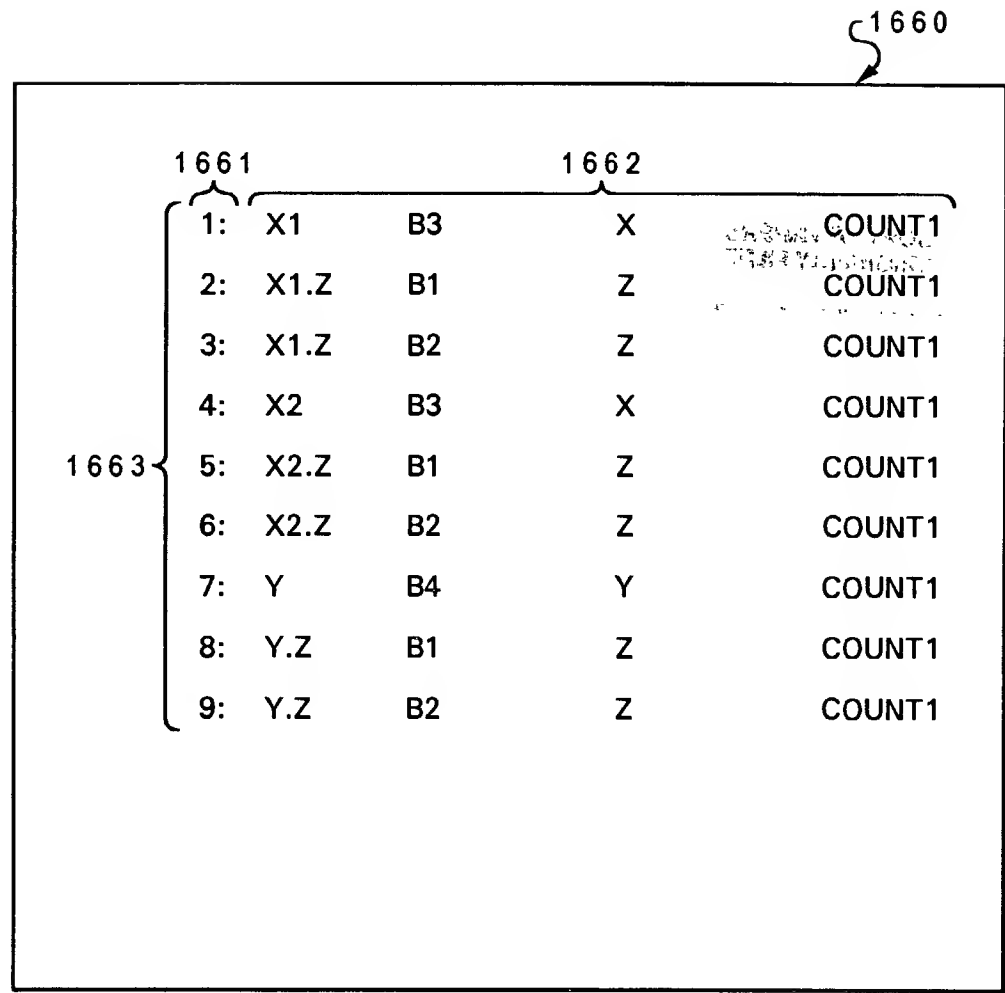


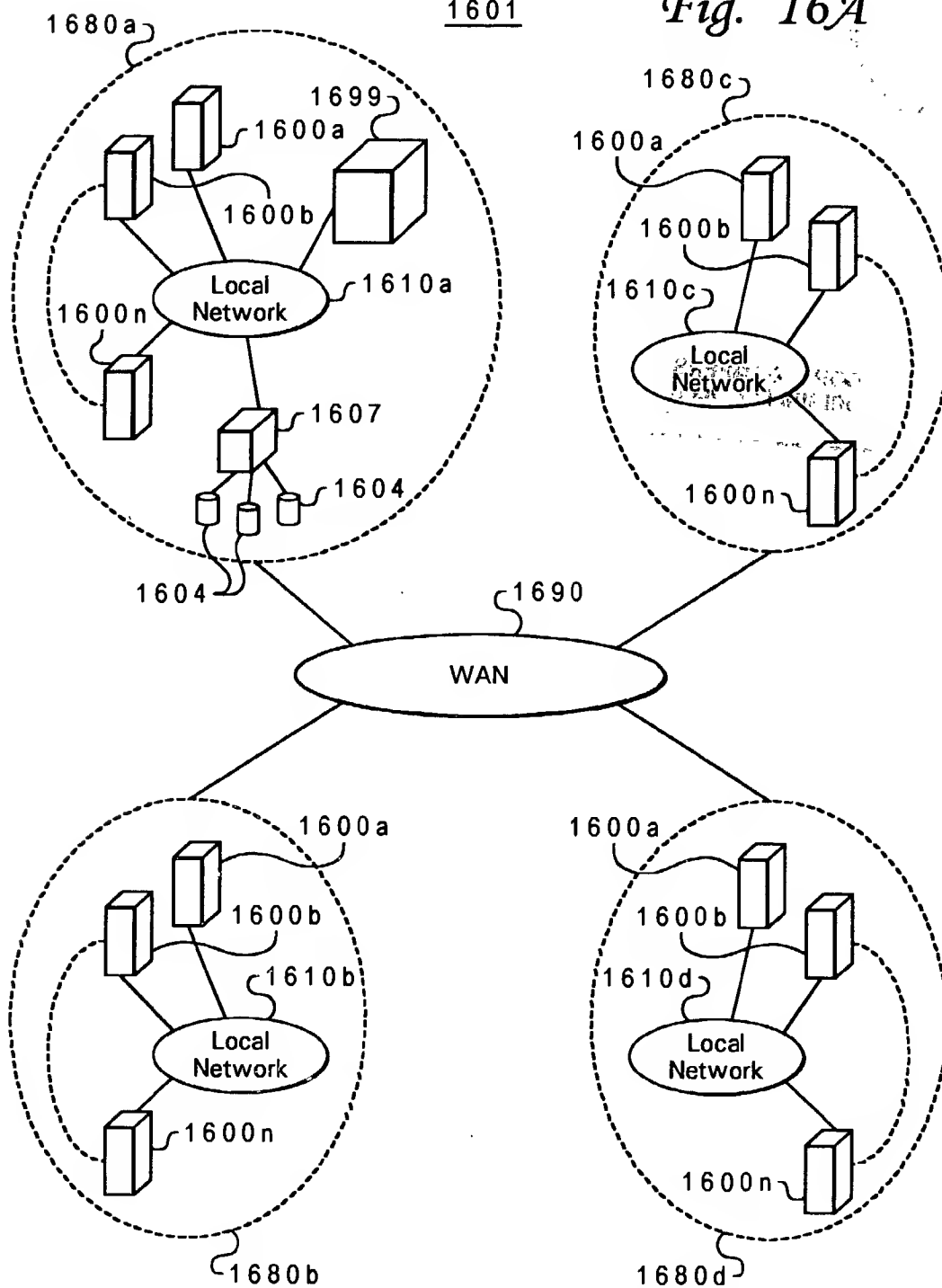
Fig. 15

AUS920010962US1  
 Gabele, et al.  
 Centralized Disabling Of Instrumentation Events  
 Within A Batch Simulation Farm Network

35/62

1601

*Fig. 16A*



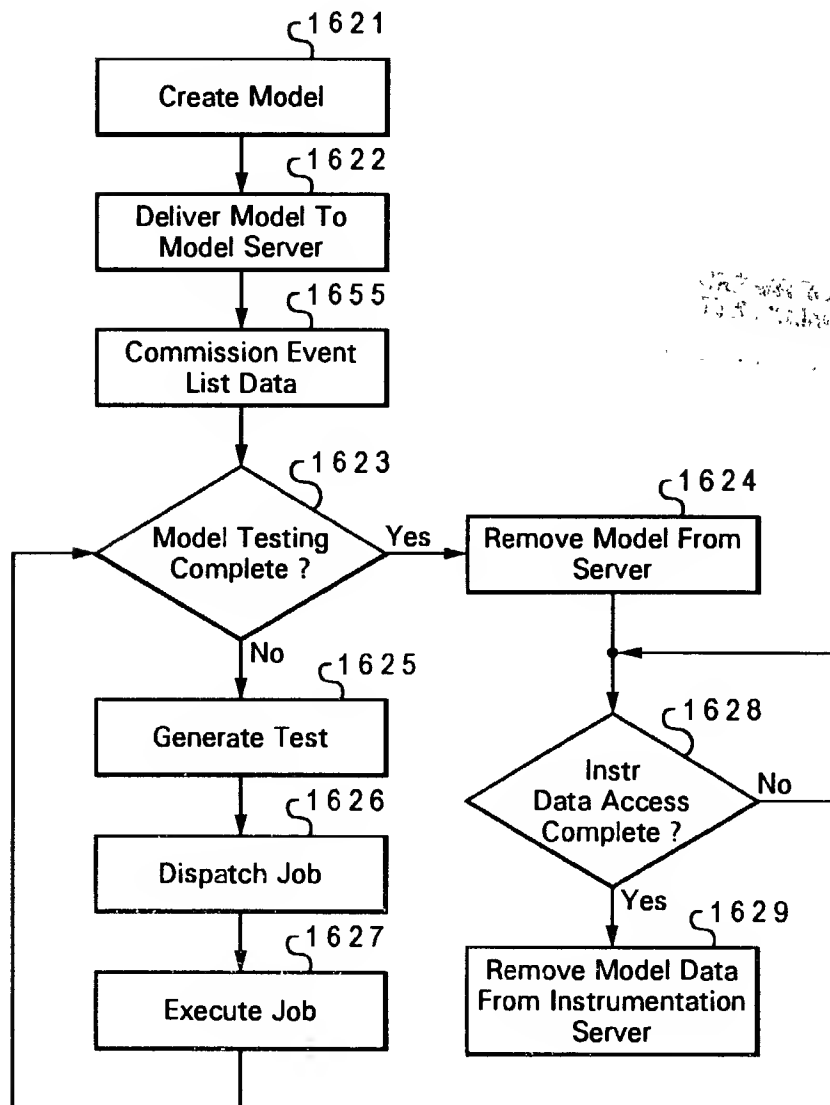


Fig. 16B

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Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

37/62

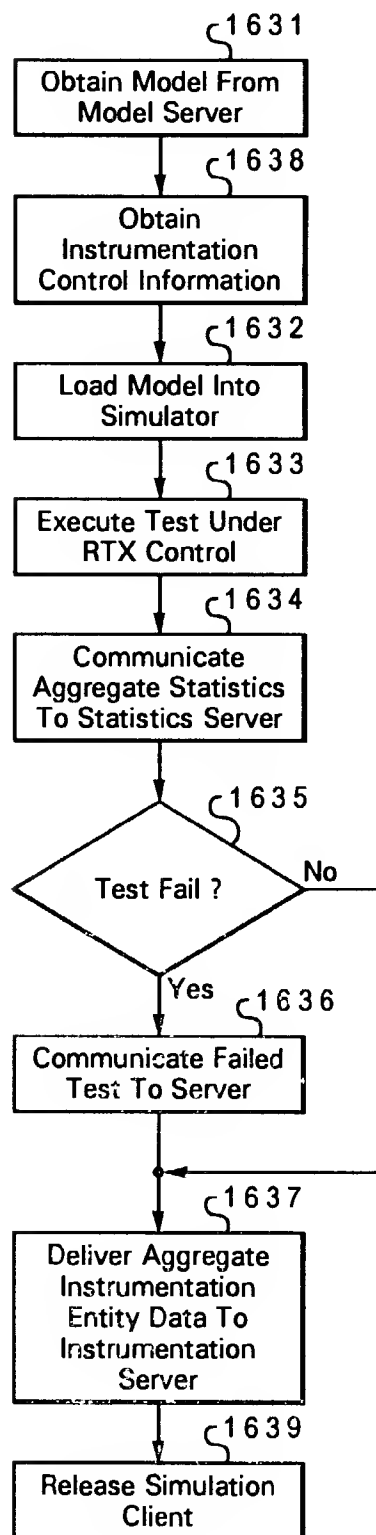


Fig. 16C

US 2010/010962 A1

AUS920010962US1

Gabele, et al.

Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

38/62

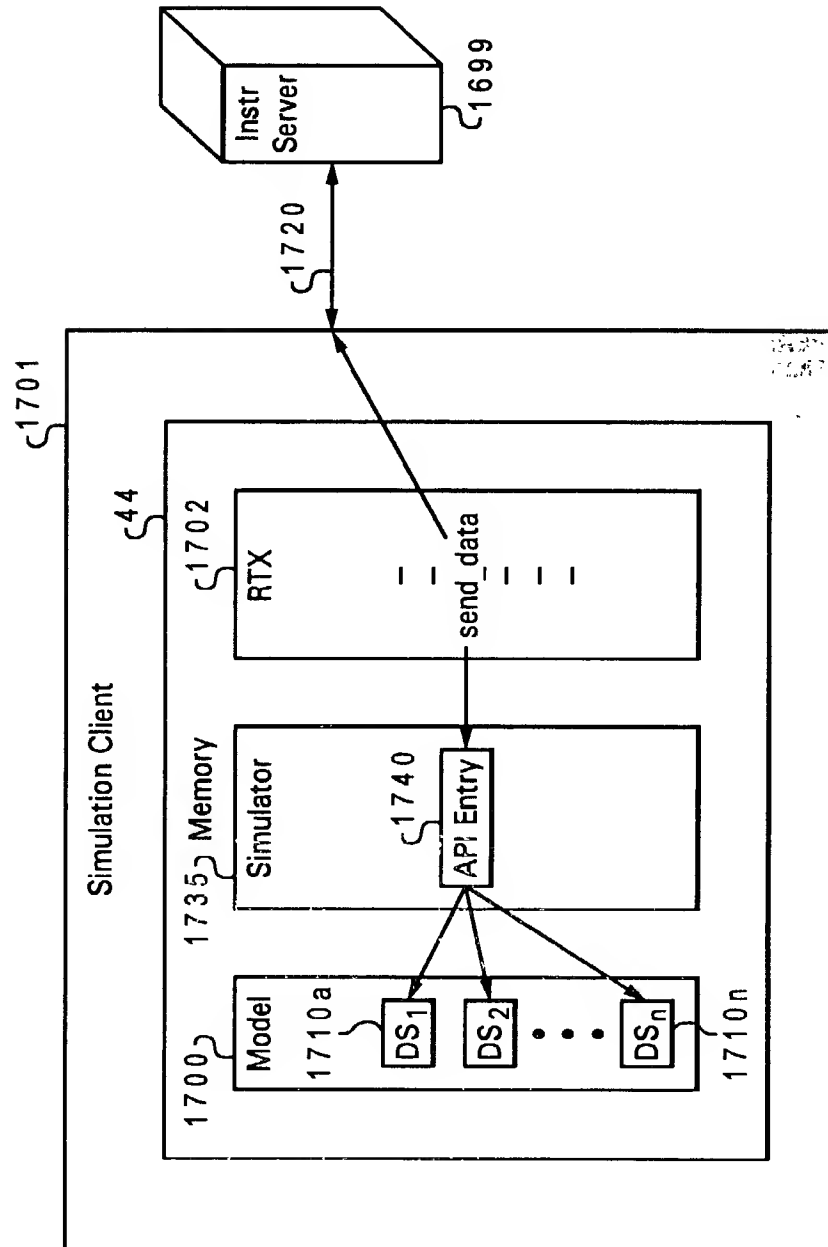
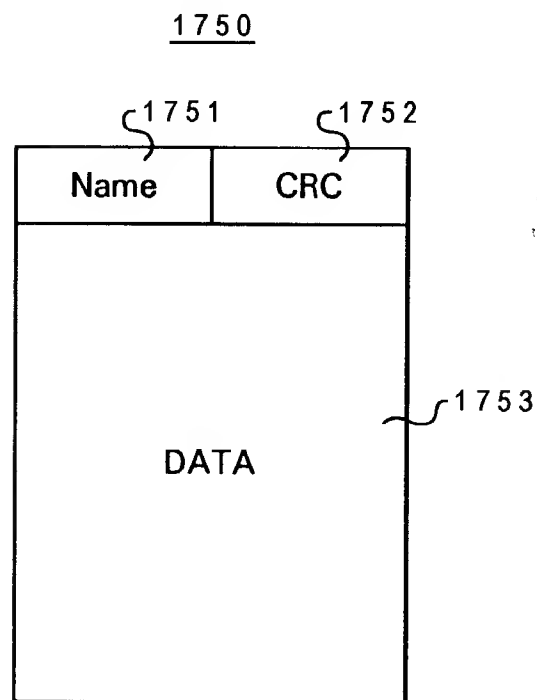


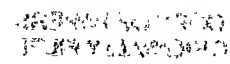
Fig. 17A

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 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

39/62



*Fig. 17B*



*Fig. 17C*



AUS920010962US1

Gabele, et al.

Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

41/62

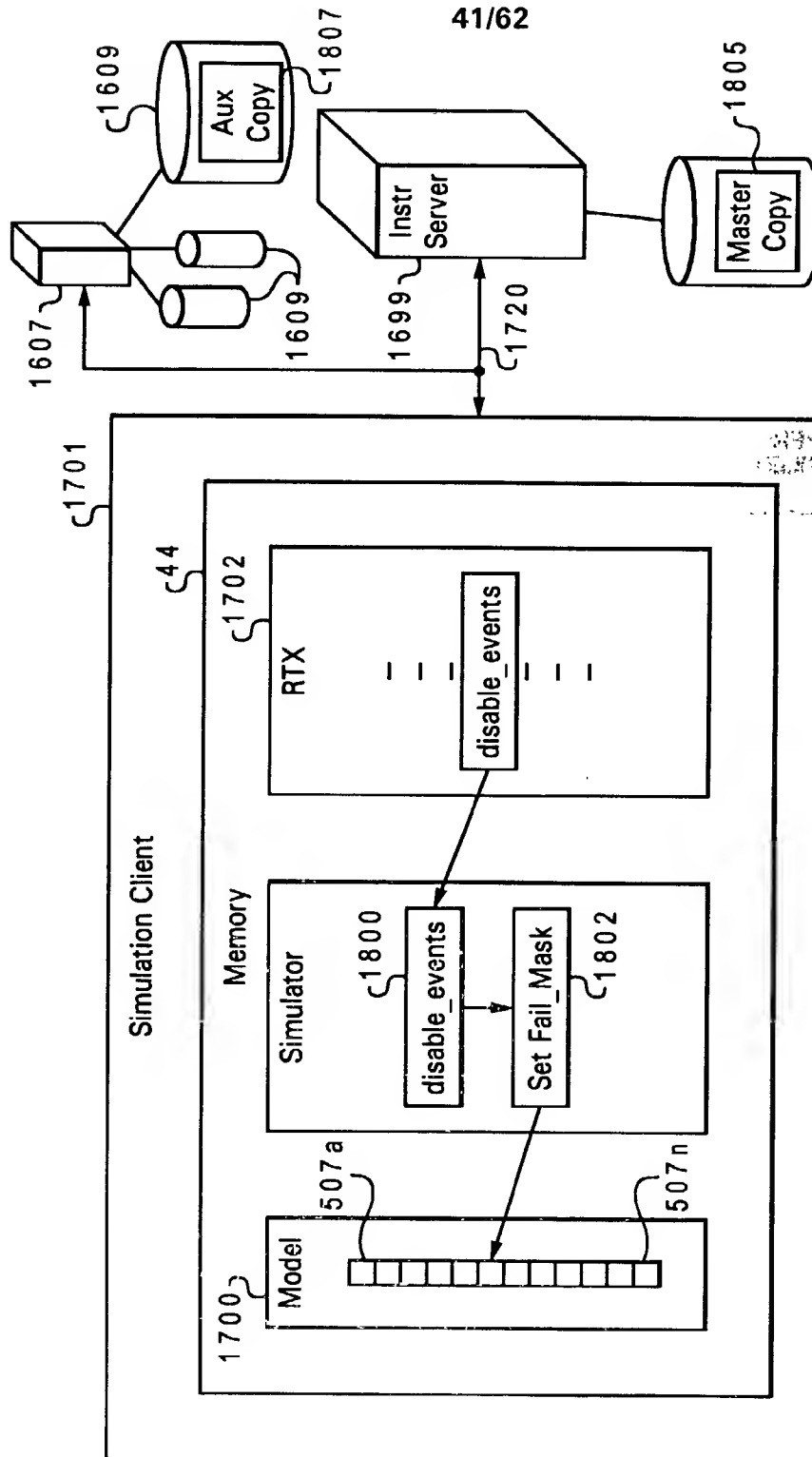
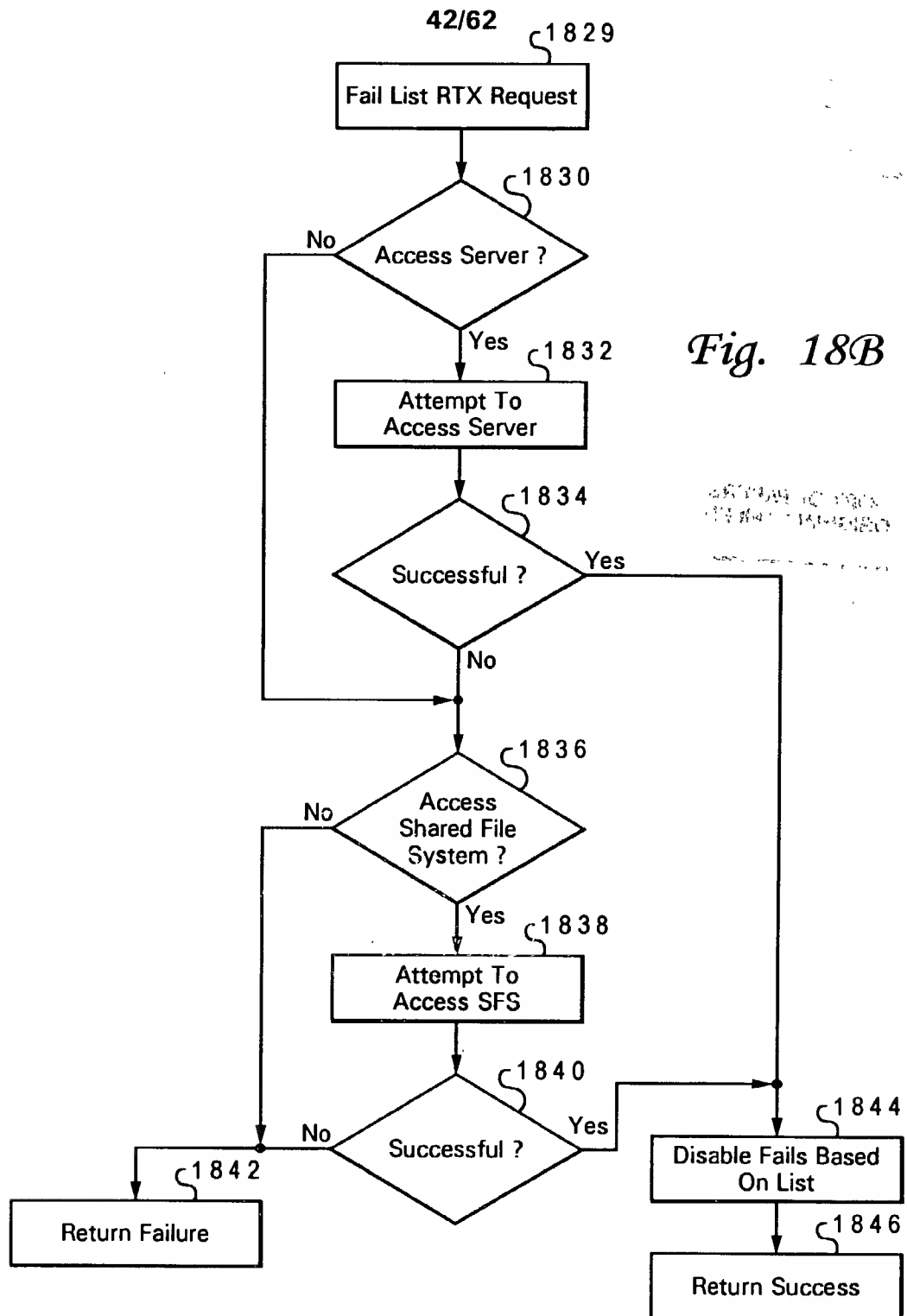


Fig. 18A

AUS920010962US1  
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Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network



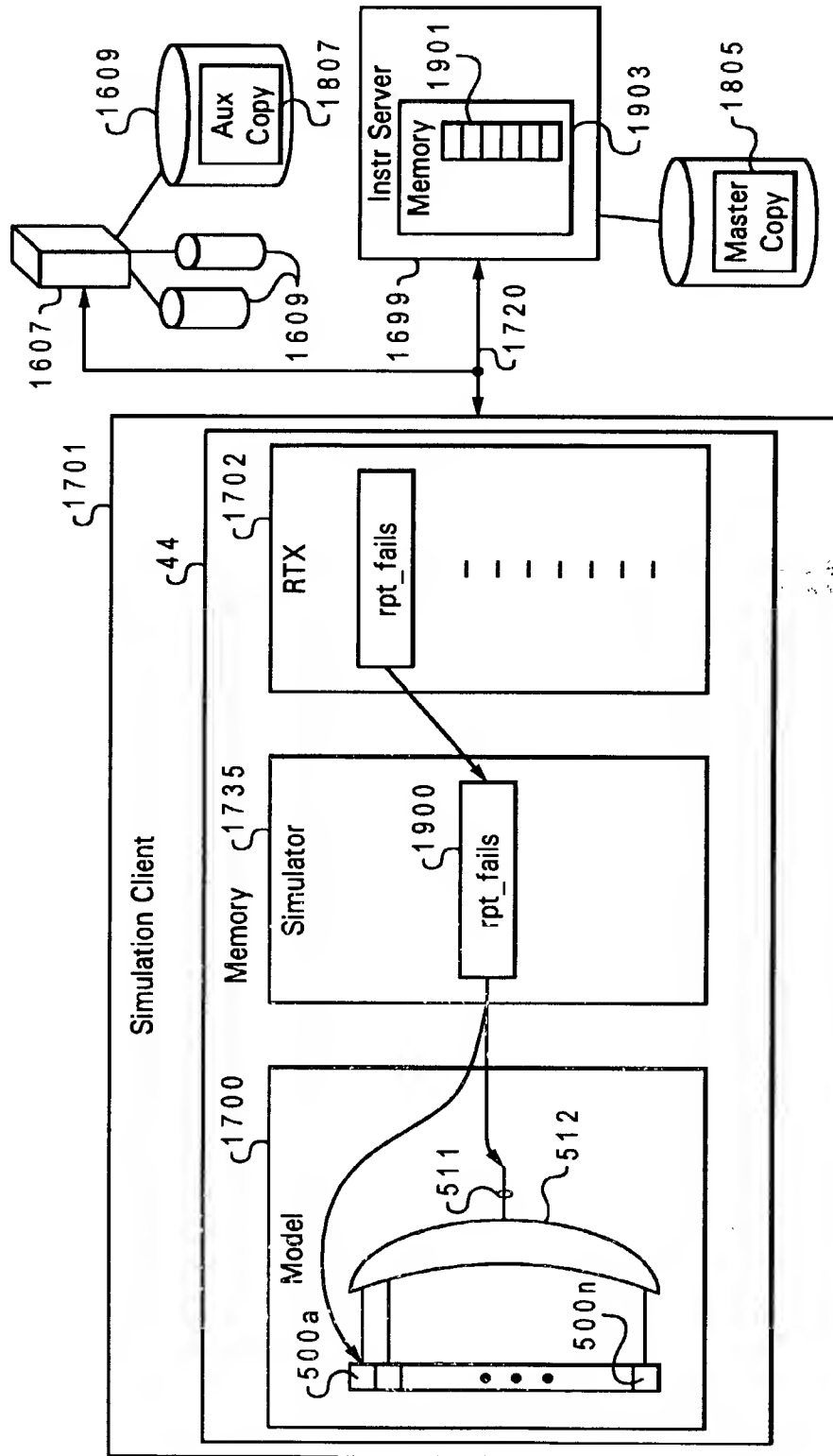
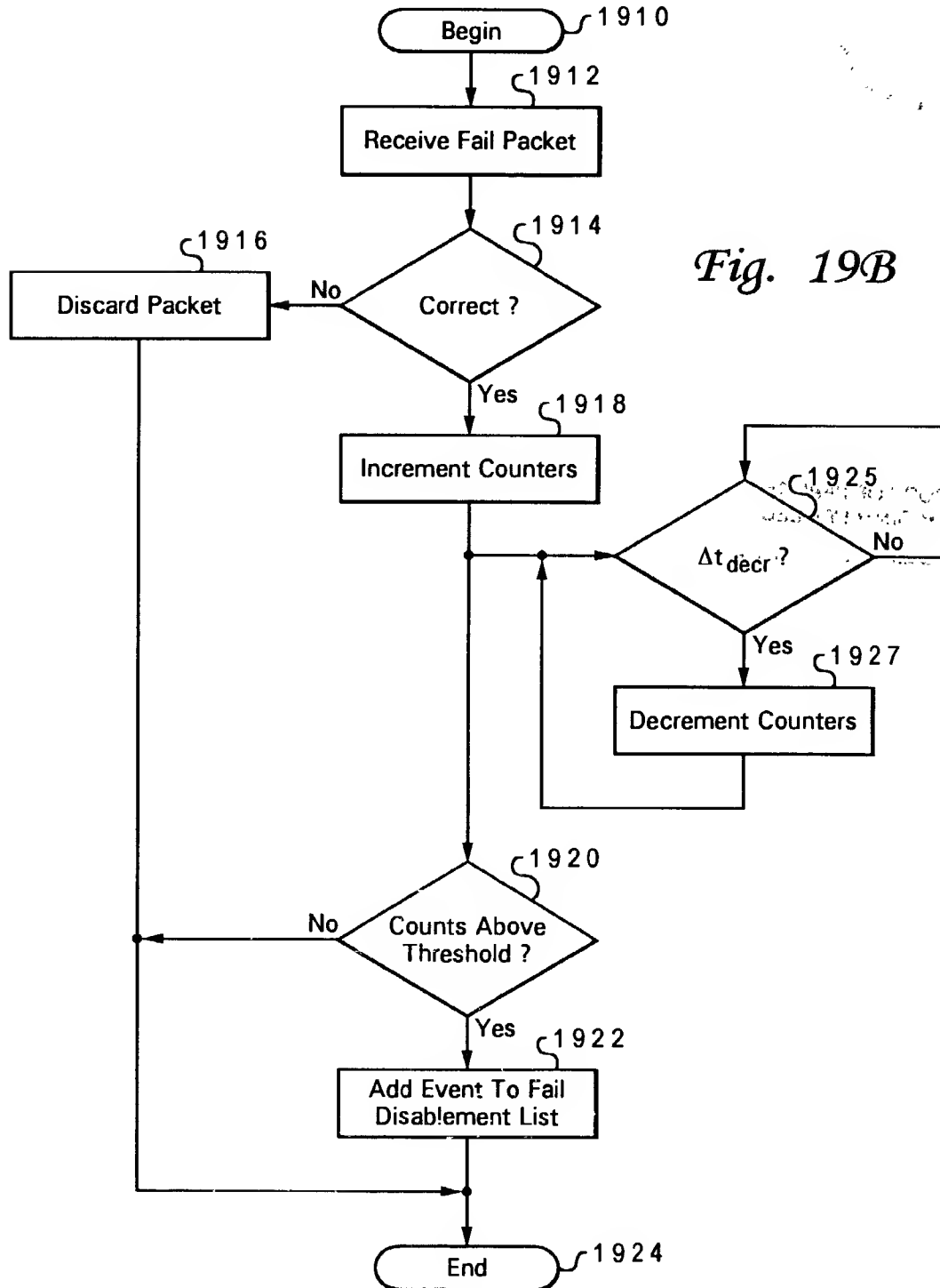


Fig. 19A

AUS920010962US1  
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Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

44/62



AUS920010962US1  
Gabele, et al.  
Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

45/62

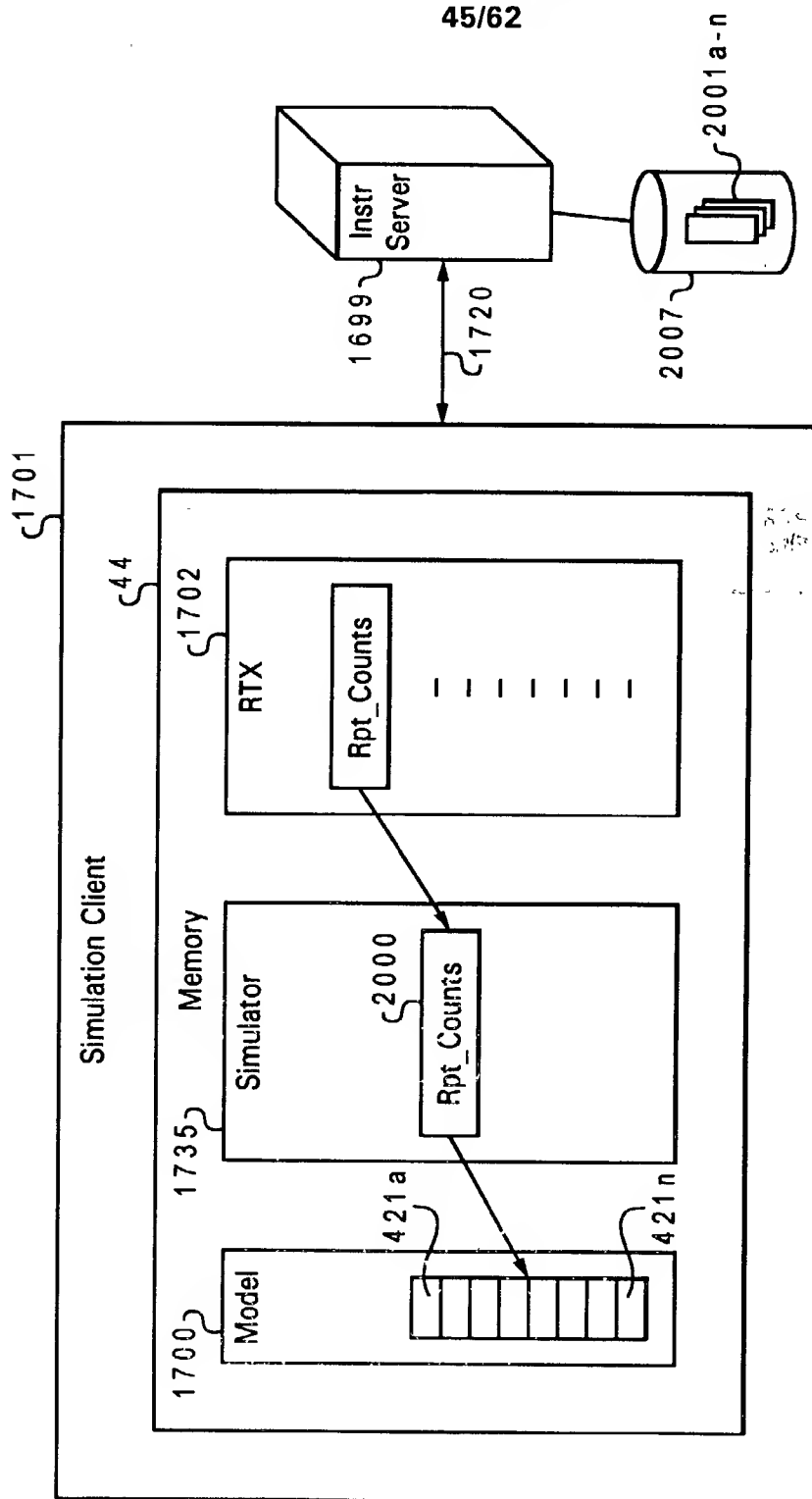
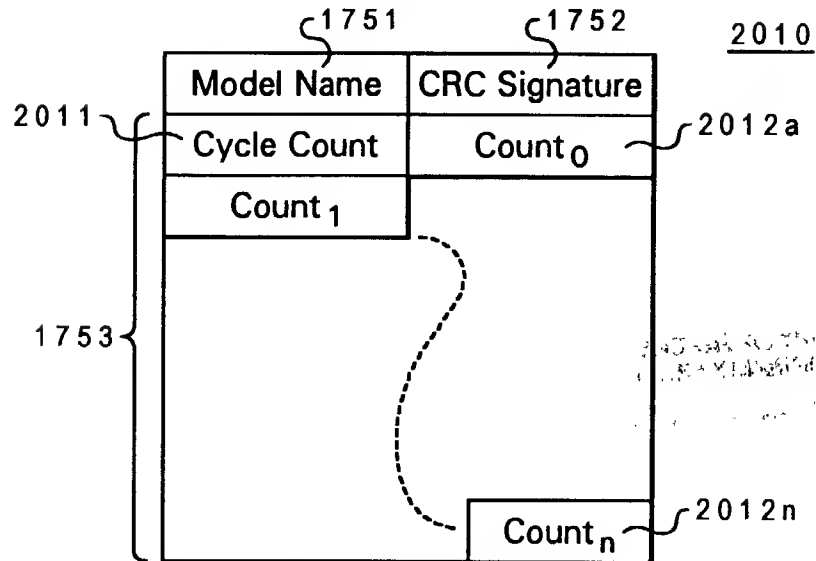
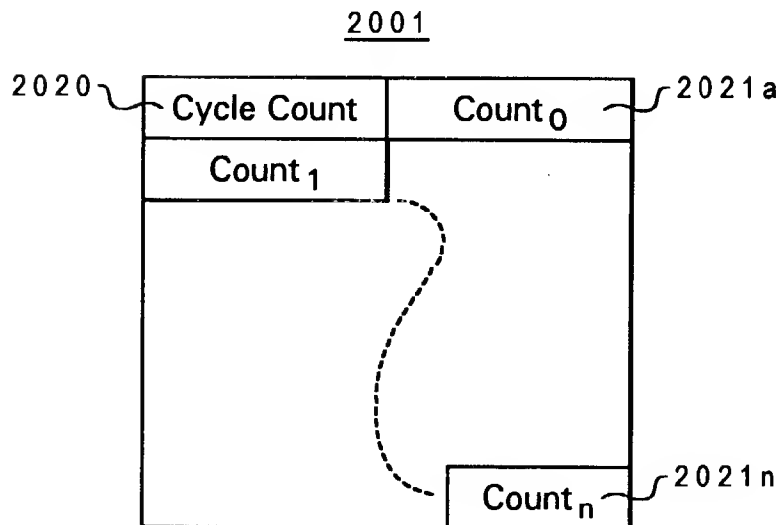


Fig. 20A

46/62

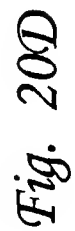


*Fig. 20B*



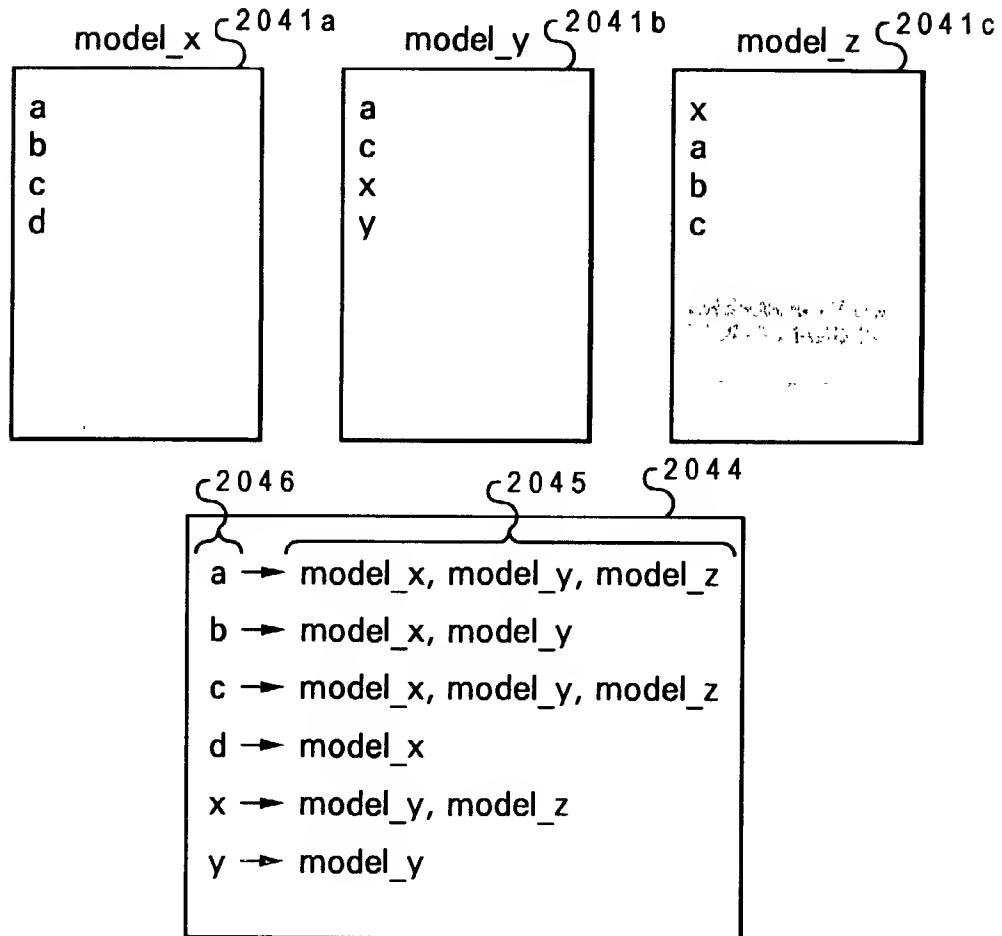
*Fig. 20C*

## 47/62



AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

48/62



*Fig. 20E*



AUS920010962US1

Gabele, et al.

Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

49/62

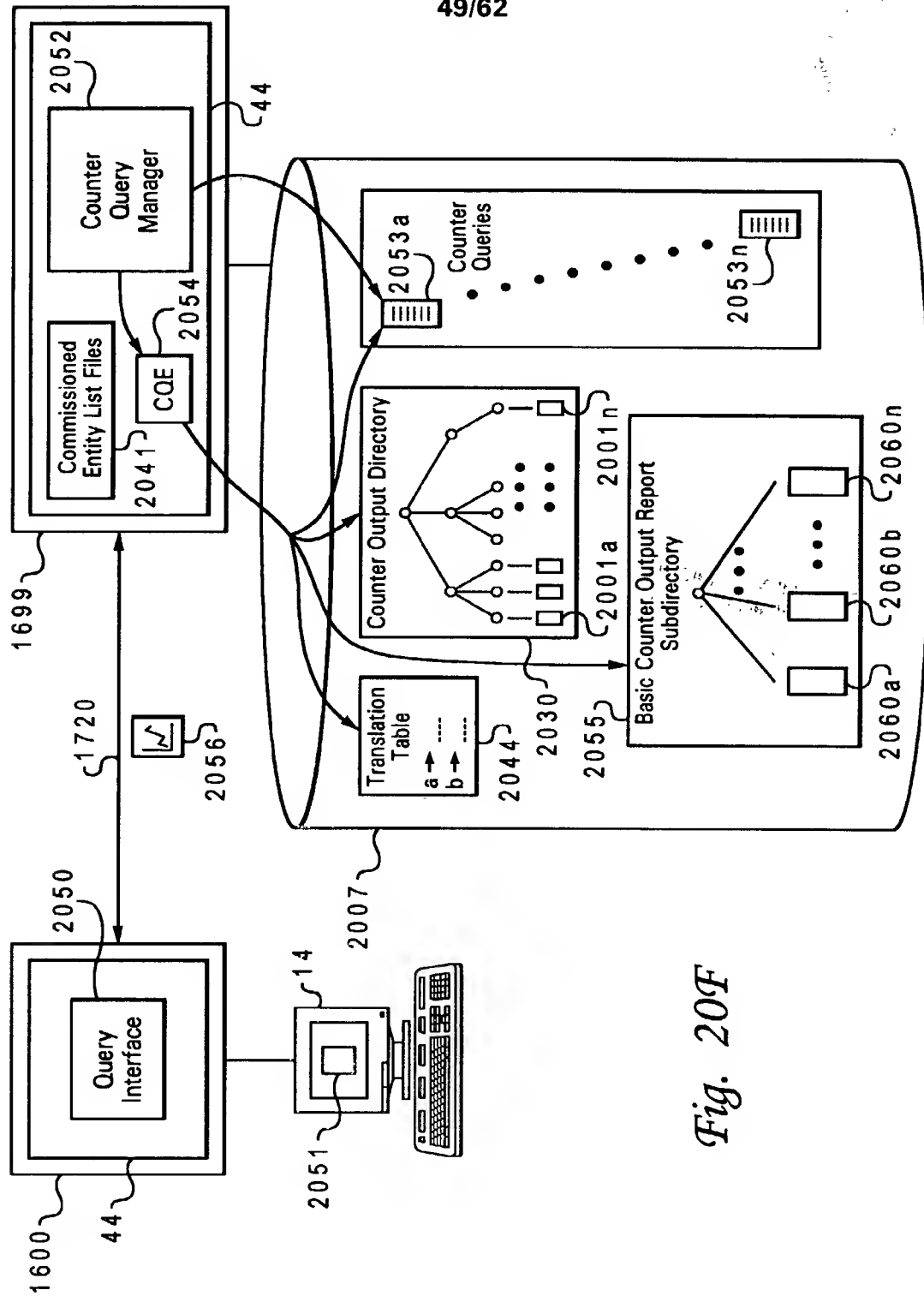
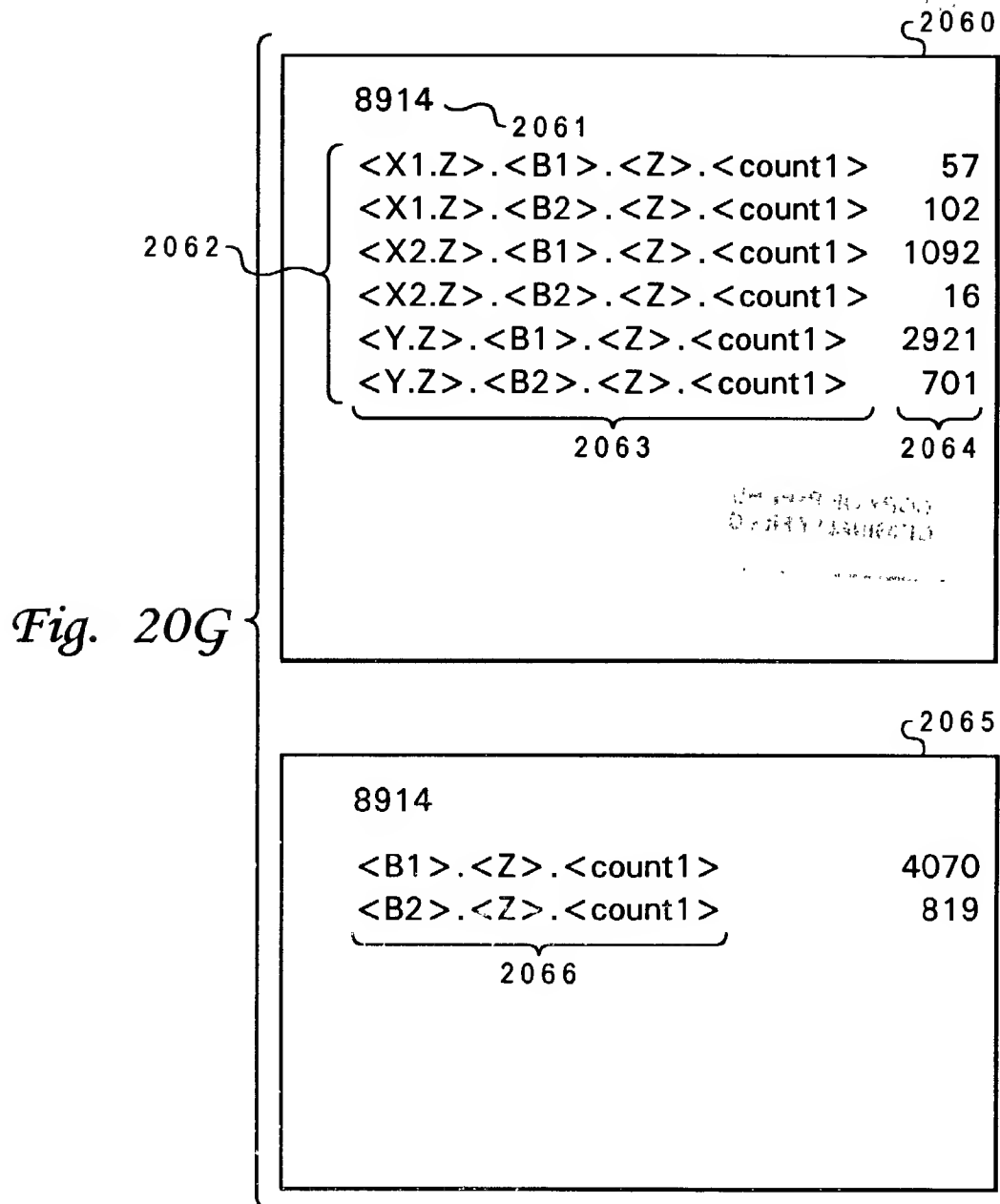


Fig. 20F

AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

50/62



AUS920010962US1  
Gabele, et al.  
Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

51/62

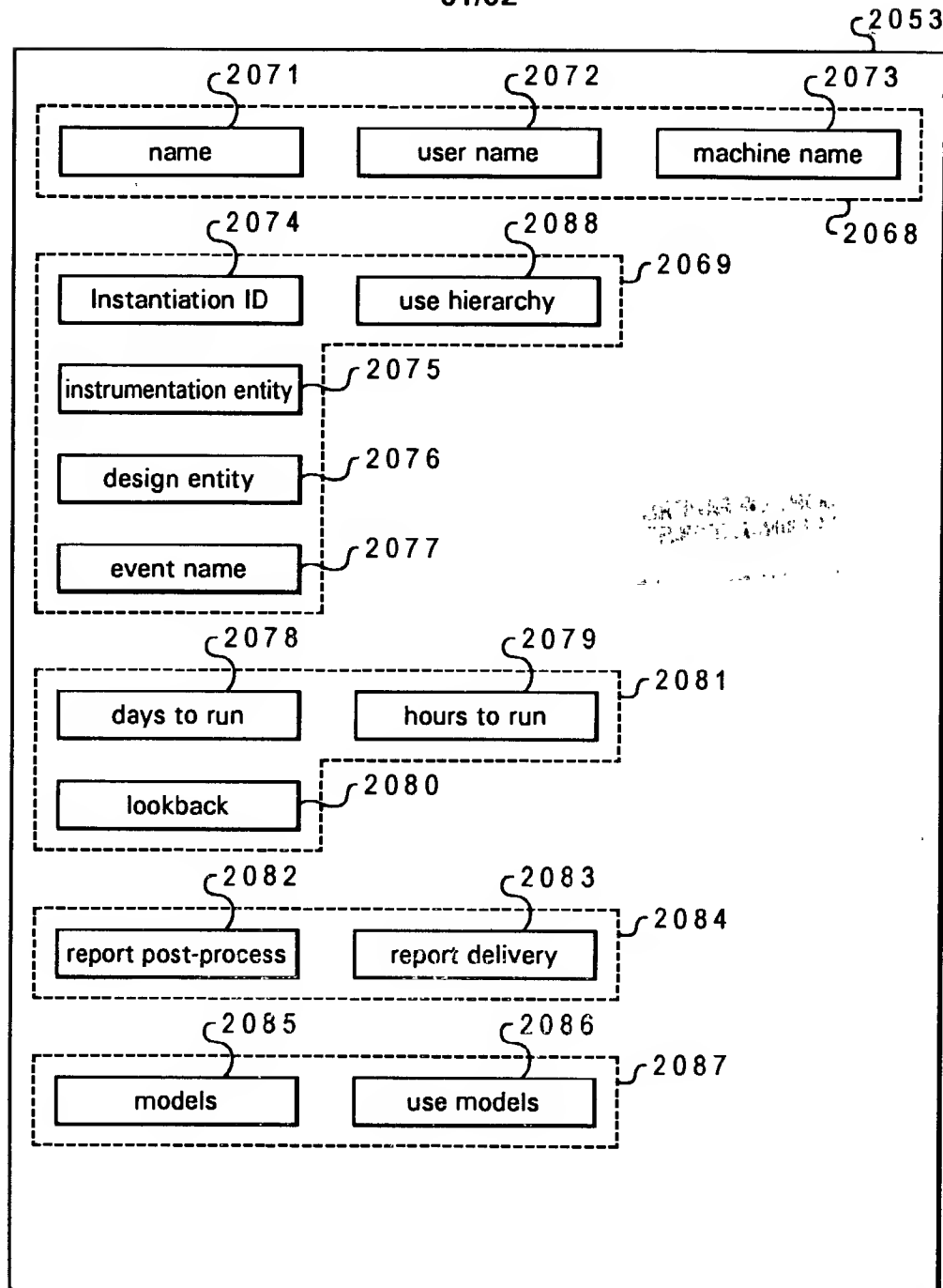


Fig. 20H

52/62

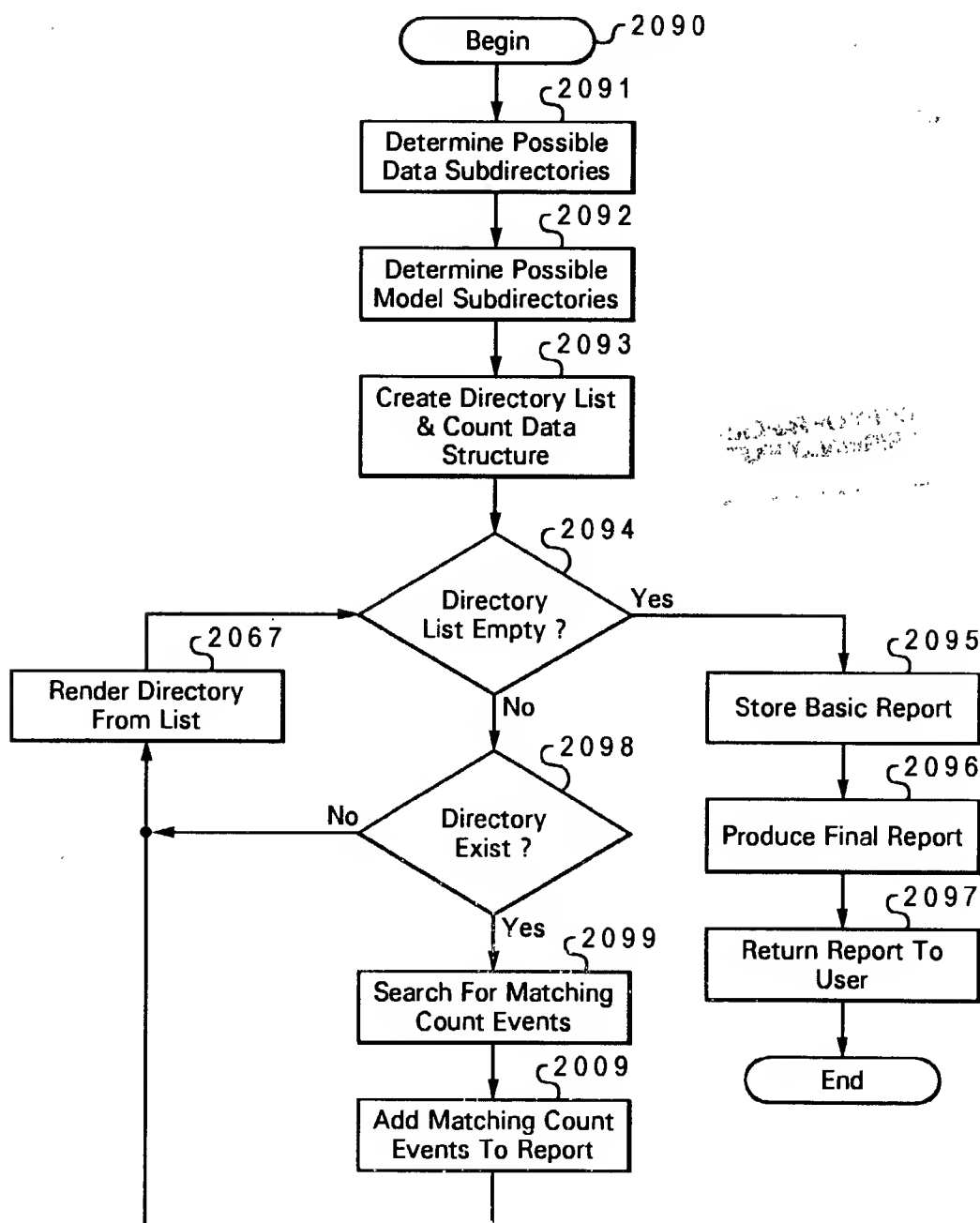
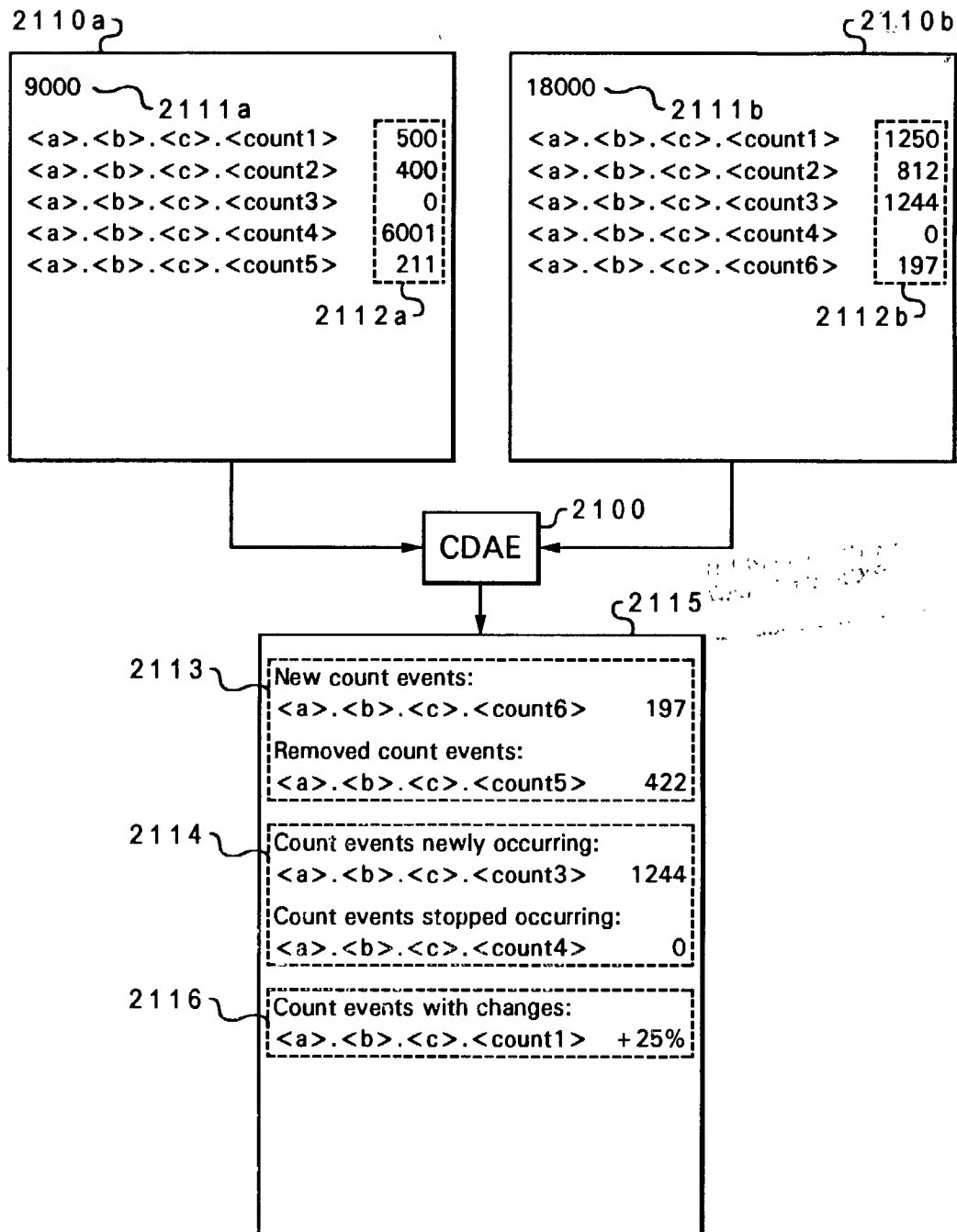


Fig. 201

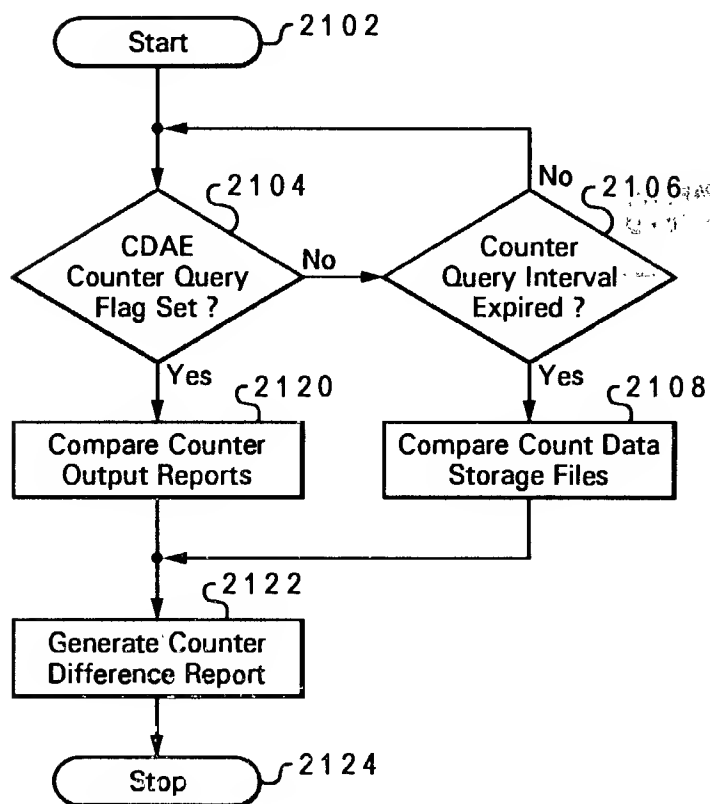
*Fig. 21A*

AUS920010962US1  
Gabele, et al.  
Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

54/62



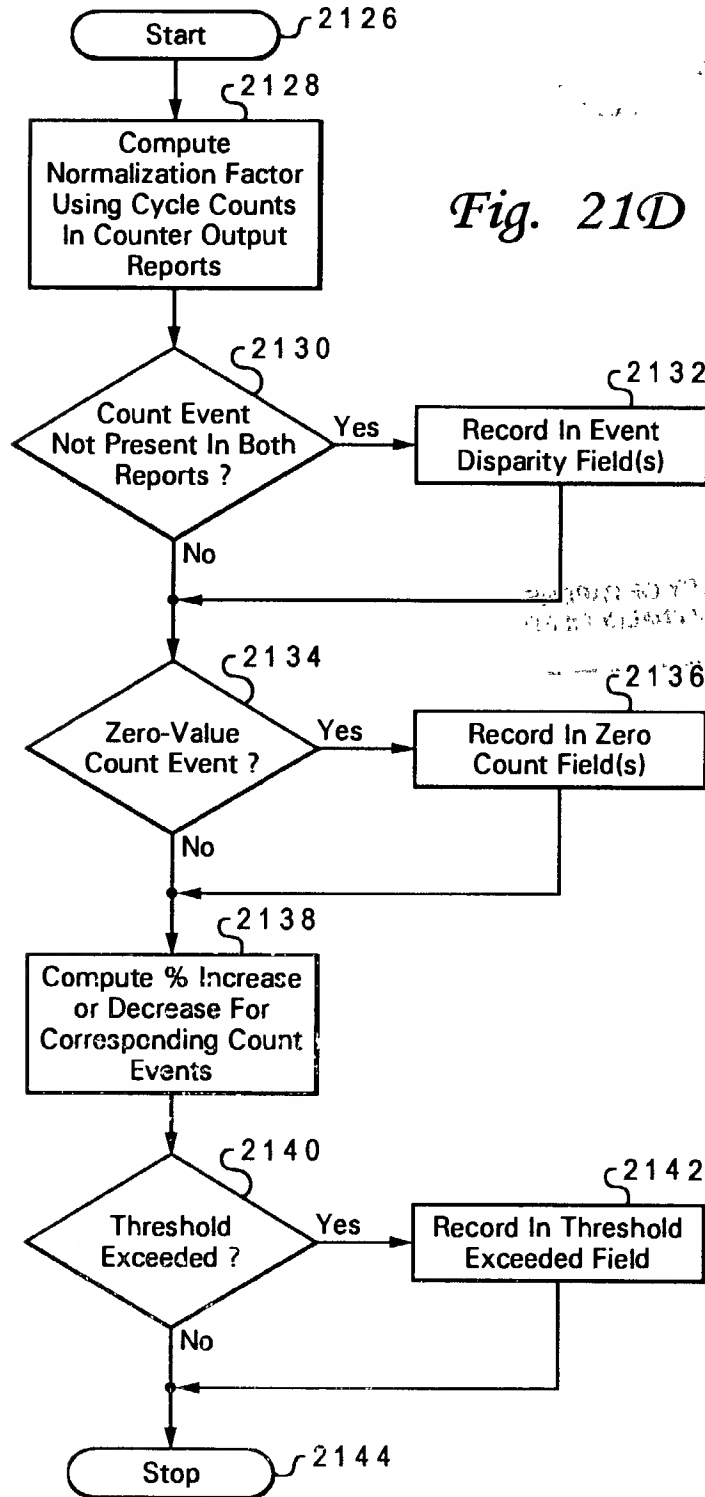
*Fig. 21B*



*Fig. 21C*

AUS920010962US1  
 Gabele, et al.  
 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

56/62





AUS920010962US1  
Gabele, et al.  
Centralized Disabling Of Instrumentation Events  
Within A Batch Simulation Farm Network

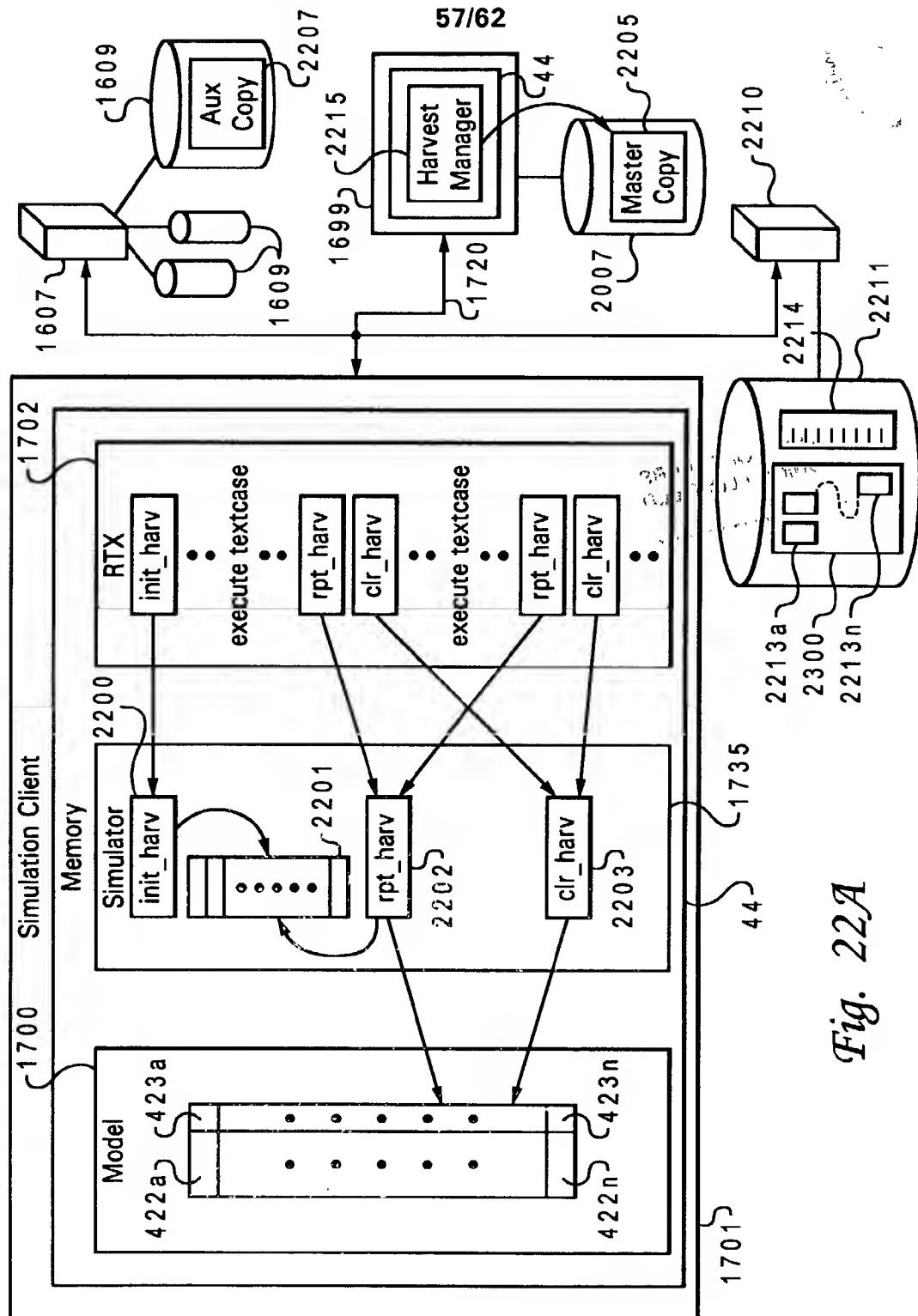


Fig. 22A

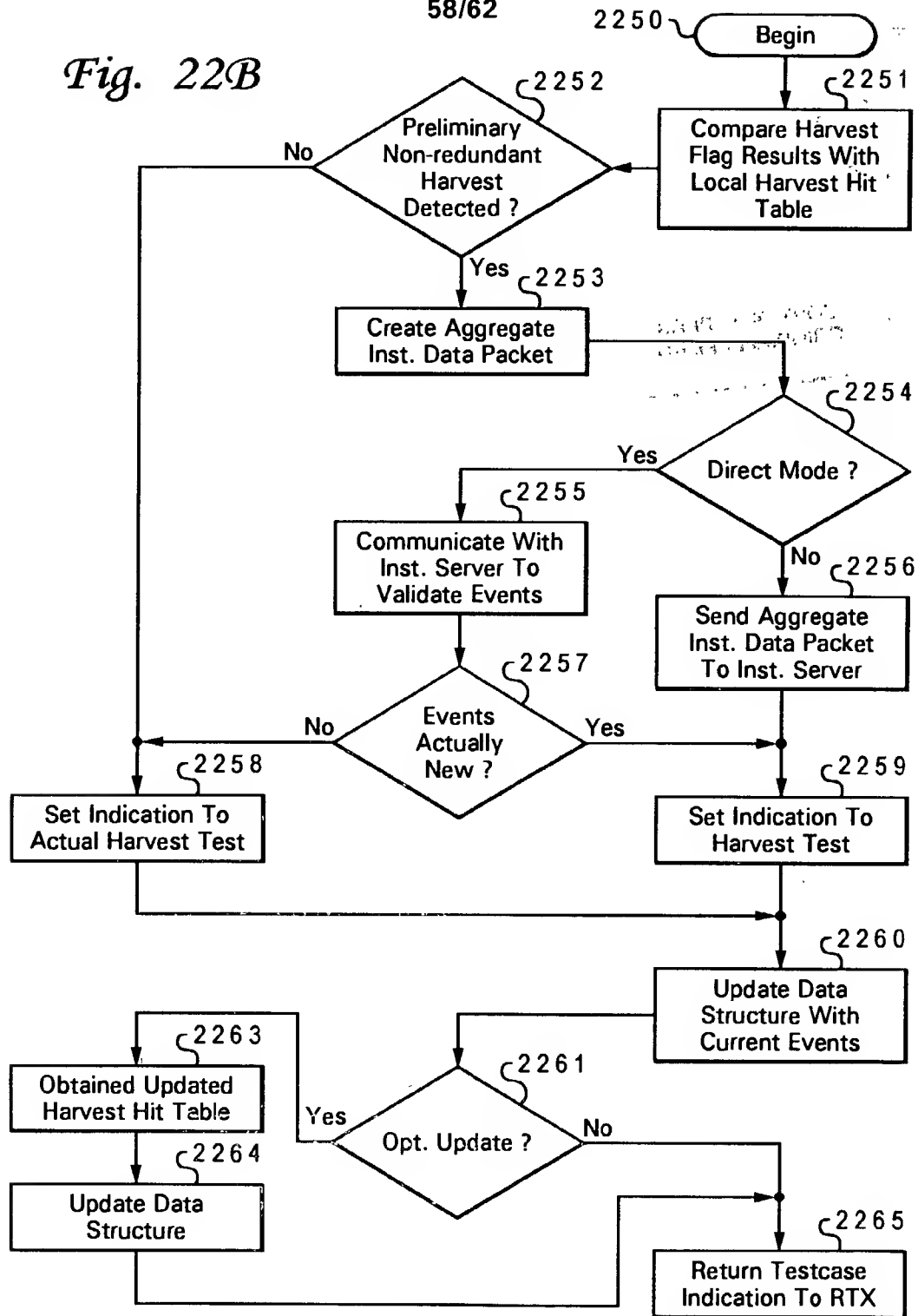
AUS920010962US1

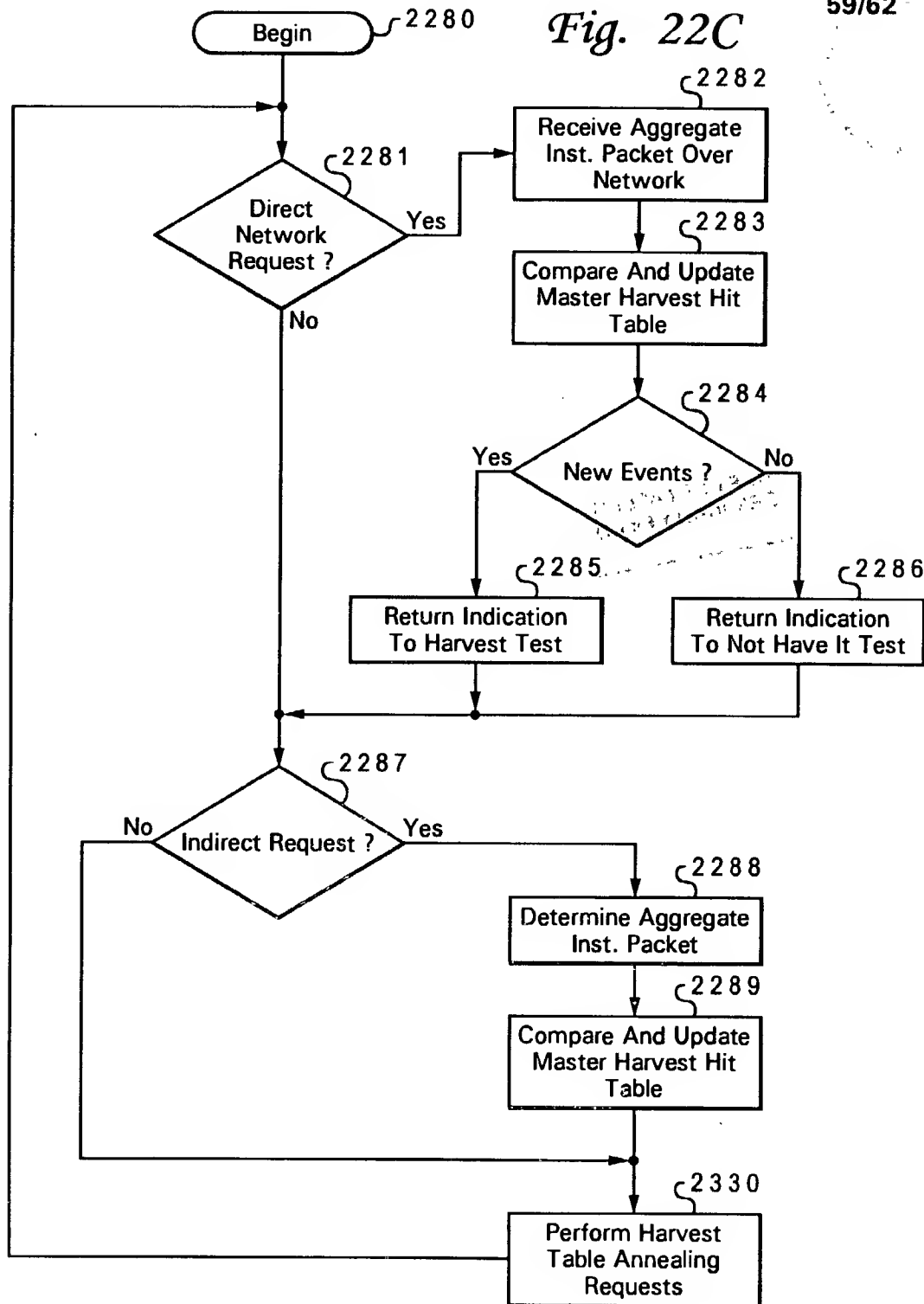
Gabele, et al.

Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

58/62

Fig. 22B





60/62

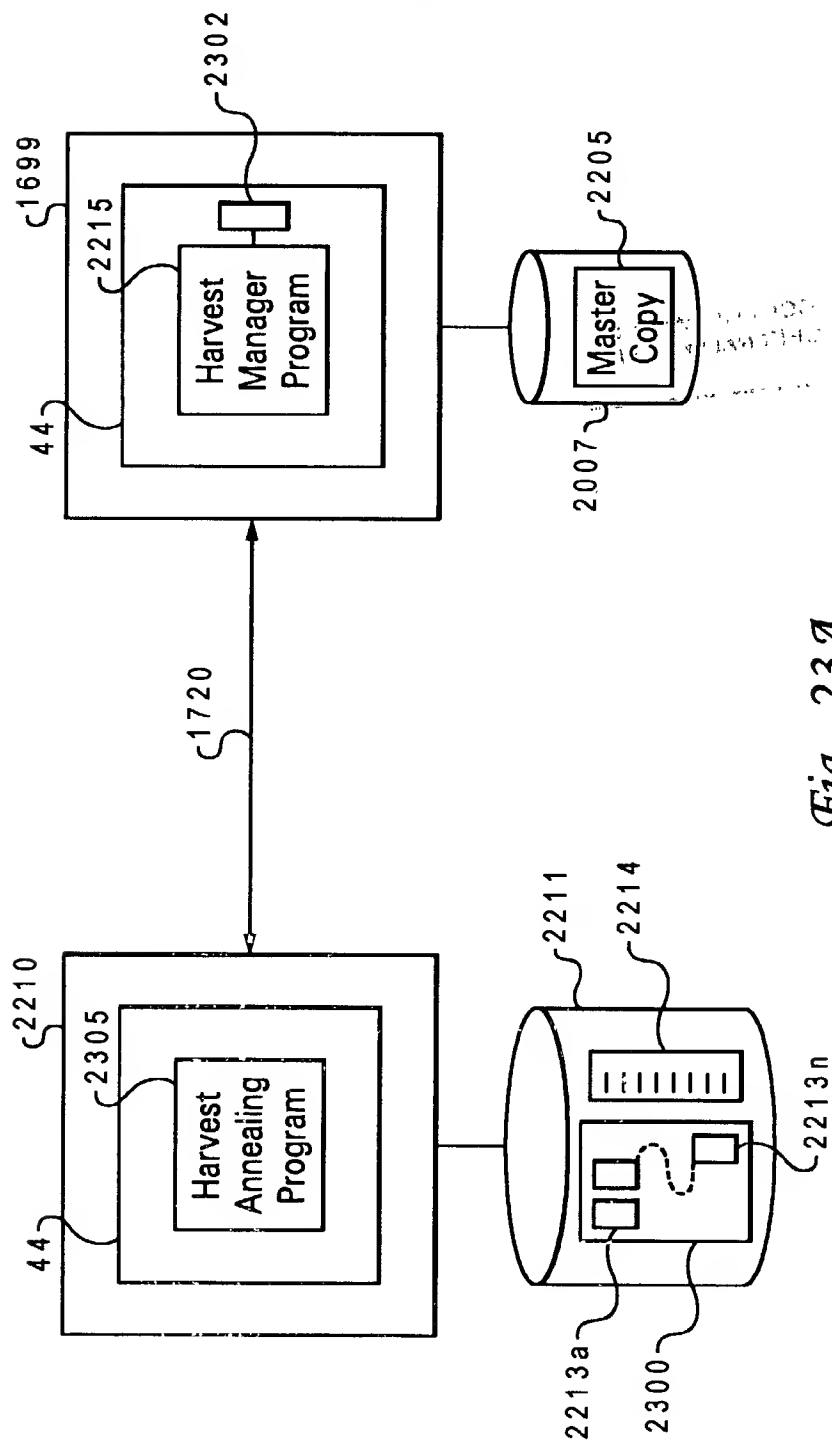
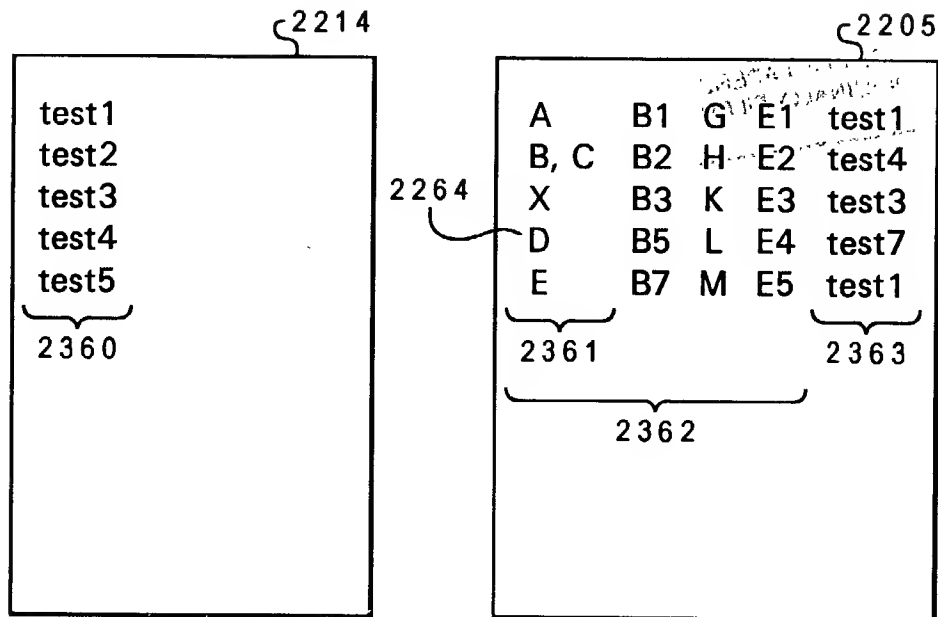


Fig. 23A

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 Centralized Disablement Of Instrumentation Events  
 Within A Batch Simulation Farm Network

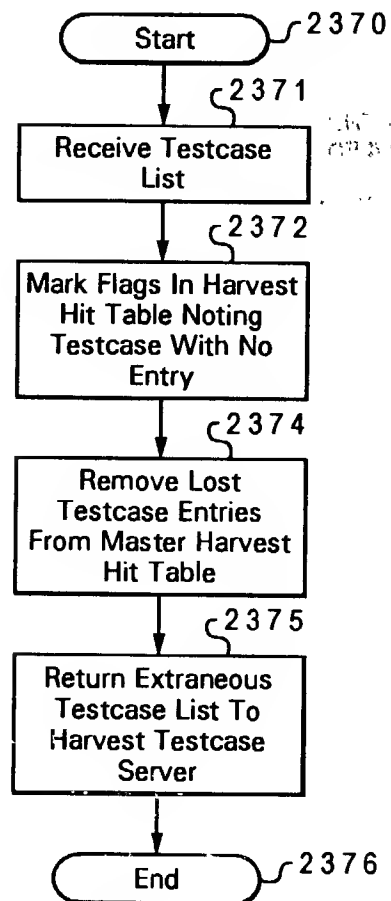
61/62



*Fig. 23B*

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Gabele, et al.  
Centralized Disablement Of Instrumentation Events  
Within A Batch Simulation Farm Network

62/62



*Fig. 23C*